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CLAIMS

[Claim(s)]

[Claim 1] The video server, the control radio station, and the image radio station are connected through the network. It is the wireless image communication system which distributes various image information on radio to a movable terminal station. Said video server Two or more kinds of image information that two or more kinds of image information is stored in the interior is offered as a shared file on a network. Said terminal station The image information the purport and self which require transmission of said image information by transmitting control information to a control radio station through the 2nd radio channel expect reception is notified. Said control radio station It directs to said image radio station through a network so that the image information said terminal station expects reception may be transmitted based on the control information received through said 2nd radio channel. Said image radio station is sharing on a network the image information which said video server stores as a shared file, and reads the image information corresponding to the directions from said control radio station from said shared file. It is the wireless image communication system with which said terminal station receives the image information which said image radio station outputted through said 1st radio channel by outputting to the 1st radio channel which is a wide band as compared with said 2nd radio channel.

[Claim 2] Said image radio station is usable in two or more communication channels within said 1st radio channel, in order to transmit image information to said terminal station. Said control radio station When the current operating condition of said communication channel is supervised and the control information from said terminal station is received, It judges whether said image radio station has a communication channel usable now. Wireless image communication system according to claim 1 characterized by directing to transmit the image information said terminal station expects reception to the image radio station concerned only when it judges that said image radio station has a communication channel usable now.

[Claim 3] Said control radio station is wireless image communication system according to claim 2 characterized by notifying the purport which cannot transmit the image information the terminal office concerned expects reception to the terminal office which has transmitted said control information when it judges that said image radio station does not have a communication channel usable now.

[Claim 4] It is the wireless image communication system according to claim 2 or 3 in which a terminal station and a communication link are possible in the 2nd communication link zone where image information is transmitted to the terminal station located in the communication link zone which two or more sets of said image radio station are installed, and has the 1st communication link zone where each can communicate, and self has, and said control radio station covers the 1st communication link zone of all image radio stations.

[Claim 5] Since each aforementioned image radio station specifies self, it has the 1st identifier which does not overlap mutually between said image radio stations. Said control radio station Each aforementioned image radio station is equipped with a menu information storing means to store the title information on the image information which can be transmitted to a terminal station. Said control radio station In order that said terminal station may notify the image

information that the image radio station which has the 1st communication link zone which carries out the current position can be transmitted. The menu information created based on the title information which said menu information storing means stores, Wireless image communication system according to claim 4 characterized by transmitting the identifier currently assigned to each image radio station concerned which can transmit the image information concerning the title information concerned to the terminal station concerned.

[Claim 6] Said terminal station has the 2nd identifier for specifying self, and the 2nd own identifier is also notified to said control radio station by transmitting said control information. Said control radio station Wireless image communication system according to claim 5 further equipped with a positional information storing means which shows the current position of the terminal station which transmitted control information for the 2nd identifier and 1st identifier which are notified by the received control information to store as information.

[Claim 7] Said control radio station is wireless image communication system according to claim 6 further equipped with a location hysteresis information storing means to store the path which the terminal office concerned moved as hysteresis information by storing the 2nd identifier and 1st identifier which are notified by the control information concerned whenever it receives the control information from a terminal office.

[Claim 8] Said control radio station the information which shows at least the 1st communication link zone which adjoins the communication link zone of each above 1st It has further a zone map storing means to store as a zone map. Said control radio station the wireless image station which has the 1st identifier notified by said control information -- and Wireless image communication system according to claim 7 which transmits the menu information concerning the title information on the image information which the wireless image station which has the 1st communication link zone which adjoins the 1st communication link zone which the wireless image station concerned has can transmit to a terminal station.

[Claim 9] Said control radio station is wireless image communication system according to claim 8 further equipped with an image hysteresis information storing means to manage the hysteresis of the image information for which the terminal office concerned wished by storing the information concerning the image information notified by the control information concerned whenever it received the control information from said terminal office.

[Claim 10] It is the wireless image communication system according to claim 1 to 9 which transmits image information from the image cache means concerned by equipping each aforementioned image radio station with an image cache means to store a part of image information which self can transmit, further when the image information which each aforementioned image radio station answers directions of said control radio station, and is transmitted exists in said image cache means.

[Claim 11] It is the wireless image communication system according to claim 1 to 10 which transmits image information from the proper information storing means concerned by equipping each aforementioned image radio station with a proper information storing means to store the image information on a proper the whole image top radio station, further when the image information which each aforementioned image radio station answers directions of said control radio station, and is transmitted exists in said proper information storing means.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] More specifically, this invention relates to the wireless image communication system which transmits various image information using a radio channel to a movable terminal station about wireless image communication system.

[0002]

[Description of the Prior Art] Drawing 27 is the block diagram showing the example of 1 configuration of the conventional wireless image communication system. Wireless image communication system is equipped with a video server 271, the image information junction section 273 connected to the video server 271 through the network 272, two or more wireless LAN base stations 275, and two or more wireless image terminals 277 in drawing 27. Each wireless LAN base station 275 has the communication link zone 276 of a proper, and is constituted possible [the wireless image terminal 277 located in the communication link zone 276 which a local station has, and a communication link]. The wireless LAN base station 275 which has the communication link zone 276 which is movable and carries out the current position of the service area freely from all the communication link zones 276, and a communication link are possible for the wireless image terminal 277. Hereafter, the configuration of each part of this wireless image communication system is explained more to a detail.

[0003] A video server 271 transmits the menu information containing the title of image information etc. to all the wireless LAN base stations 275 so that the wireless image terminal 277 can retrieve the image information stored in the interior. Moreover, a video server 271 answers a demand from the wireless image terminal 277, and distributes the image information stored in the interior to the wireless image terminal 277. A network 272 transmits the menu information and image information which are transmitted from a video server 271 to the image information junction section 273. Moreover, a network 272 transmits the control information collected by the image information junction section 273 to a video server 271.

[0004] The image information junction section 273 receives the menu information and image information which the video server 271 transmitted through a network 272, and distributes them to each wireless LAN base station 275 according to the content of the received menu information or image information. Moreover, the image information junction section 273 collects the control information from each wireless image terminal 277 transmitted from each wireless LAN base station 275, and outputs it to a network 272 that it should transmit to a video server 271.

[0005] Each wireless LAN base station 275 transmits menu information and image information to the wireless image terminal 277 directly. Moreover, the wireless LAN base station 275 collects the control information transmitted from the wireless image terminal 277 located in the communication link zone 276 of a proper, and outputs it to the image information junction section 273. The wireless image terminal 277 outputs the control information containing the Request to Send of the image information determined to the video server 271 to the wireless LAN base station 275, after determining the image information which wishes to transmit from the menu information distributed from the wireless LAN base station 275. Moreover, the wireless

image terminal 277 reproduces as an image etc. the image information which carried out the Request to Send to the video server 271.

[0006] In the wireless image communication system which has the above configurations, a procedure until the wireless image terminal 277 receives distribution of image information from a video server 271 is hereafter explained to a detail. As mentioned above, a video server 271 outputs the menu information corresponding to all the wireless LAN base stations 275. The image information junction section 273 distributes the menu information which inputted menu information through the network 272 every wireless LAN base station 275, and outputs it to the corresponding wireless LAN base station 275. Each wireless LAN base station 275 is sent out to the communication link zone 276 where a local station has the menu information inputted from the image information junction section 273.

[0007] The wireless image terminal 277 receives the menu information sent out in the communication link zone 276 concerned, when it advances into the communication link zone 276. Into the received menu information, if the wireless image terminal 277 has the image information which wishes to transmit, it will generate the control information containing the Request to Send of the image information concerned, and will output it in the wireless LAN base station 275. This control information is transmitted in the wireless LAN base station 275, the image information junction section 273, and a network 272, and is received by the video server 271. A video server 271 will recognize that the wireless image terminal 277 is demanding transmission of image information, if control information is received. A video server 271 retrieves the image information stored in the interior, outputs the image information which the wireless image terminal 277 is demanding to ejection, and outputs the image information concerned to a network 272. This image information is transmitted, depends a network 272, the image information junction section 273, and the wireless LAN base station 275 wireless image terminal 277, and is received. The wireless image terminal 277 outputs the received image information as an image etc.

[0008]

[Problem(s) to be Solved by the Invention]

[0009] In the conventional wireless image communication system, each wireless LAN base station 275 performs transceiver processing of control information and image information. Since image information and control information are transmitted using the same channel, each wireless LAN base station 275 cannot perform simultaneously transceiver processing of image information, and transceiver processing of control information. Therefore, each wireless LAN base station 275 must perform processing which interrupts transceiver processing of the image information concerned and transmits the received control information to the image information junction section 273, if control information is transmitted to the midst which is performing transceiver processing of image information from the wireless image terminal 277. Now, the transmission speed of image information fell and there was a trouble that the way piece of a receiving image arose in the wireless image terminal 277. Especially, many wireless image terminals 277 are located in the same communication link zone 276, and this trouble will become serious, when control information is transmitted all at once from two or more wireless image terminals 277.

[0010] Moreover, in the conventional wireless image communication system, if the image information which the video server 271 stores in the interior is updated, menu information must also be updated by the new thing. Therefore, if image information is updated during this wireless image communication system employment, a video server 271 must interrupt transmitting processing of image information, and must reconfigure menu information. Therefore, when a video server 271 sent out image information, there was a trouble that the throughput fell.

[0011] Moreover, in the conventional wireless image communication system, when two or more video servers 271 are connected to a network 272, it is necessary to include the information which shows in which video server 271 the image information specified by the title else [, such as a title of image information,] is stored in menu information. Therefore, the amount of data of the control information transmitted to the wireless image terminal 277 increases from each wireless LAN base station 275. The increment in this amount of data originated, the transmission speed of image information fell, and there was a trouble of affecting the quality of the image

reproduced in the wireless image terminal 277.

[0012] Furthermore, in the conventional wireless image communication system, while receiving image information, even if the wireless image terminal 277 moves to other communication link zones 276, a video server 271 cannot recognize this migration. Therefore, image information will continue being outputted to the communication link zone 276 in which it was located before this wireless image terminal's 277 moving. It becomes impossible moreover, for the wireless image terminal 277 to receive image information in the communication link zone 276 after migration. That is, unnecessary image information will be transmitted in the inside of a network 272, and there was a trouble that traffic increased.

[0013] So, the object of this invention is offering the wireless image communication system which can receive comfortably image information with a quality wireless image terminal. Moreover, other objects of this invention are offering the wireless image communication system which can use the channel for transmitting and receiving image information etc. effectively.

[0014]

[The means for solving a technical problem and effectiveness] As for the 1st invention, the video server, the control radio station, and the image radio station are connected through the network. It is the wireless image communication system which distributes various image information on radio to a movable terminal station. A video server Two or more kinds of image information that two or more kinds of image information is stored in the interior is offered as a shared file on a network. A terminal station The image information the purport and self which require transmission of image information by transmitting control information to a control radio station through the 2nd radio channel expect reception is notified. A control radio station It directs to an image radio station through a network so that the image information the terminal station expects reception may be transmitted based on the control information received through the 2nd radio channel. An image radio station Are sharing on a network the image information which a video server stores as a shared file, and the image information corresponding to the directions from a control radio station is read from a shared file. Outputting to the 1st radio channel which is a wide band as compared with the 2nd radio channel, a terminal station receives the image information which the image radio station outputted through the 1st radio channel.

[0015] According to the 1st invention, a control radio station receives the control information from the terminal station from the 2nd radio channel, and an image radio station transmits image information to a terminal station using the 1st radio channel. Thus, an image radio station should play only the role of transmitting image information, by changing the channel which a control radio station and an image radio station use. Therefore, the load of an image radio station becomes low. Furthermore, in order that an image radio station may share image information as a shared file on a network by the video server, an unnecessary transmission signal is not sent out on a network. By this, a network can make low possibility of lapsing into a congestion condition.

[0016] The 2nd invention is set to the 1st invention. An image radio station In order to transmit image information to a terminal station, are usable in two or more communication channels within the 1st radio channel. A control radio station When the current operating condition of a communication channel is supervised and the control information from a terminal station is received, Only when it judges whether an image radio station has a communication channel usable now and judges that an image radio station has a communication channel usable now, it is characterized by directing to transmit the image information the terminal station expects reception to the image radio station concerned.

[0017] According to the 2nd invention, two or more communication channels are prepared in each image radio station. The control radio station has managed the operating condition of the communication channel by each image radio station, and only when it judges that an image radio station has a communication channel usable now, it directs that it transmits the image information the terminal station expects reception to the image radio station concerned. That is, when an image radio station does not have a communication channel usable now, even if there is a demand of image information from a terminal station, transmission of the image information will not be directed to an image radio station. Therefore, it is lost that an unnecessary signal is sent out on a network and possibility that a network lapses into a congestion condition by this can be

made low.

[0018] 3rd invention is characterized by a control radio station notifying the purport which cannot transmit the image information the terminal office concerned expects reception to the terminal office which has transmitted control information, when it judges that an image radio station does not have a communication channel usable now in the 2nd invention.

[0019] According to the 3rd invention, a control radio station notifies the purport which cannot transmit the image information the terminal office concerned expects reception to the terminal office which has transmitted control information, when it judges that an image radio station does not have a communication channel usable now. By this advice, a terminal office can notify again the image information the purport and self which require transmission of image information by transmitting control information to a control radio station through the 2nd radio channel expect reception, and user-friendly wireless image communication system can be offered now.

[0020] The 4th invention transmits image information to the terminal station located in the communication link zone which two or more image radio stations are installed, and has the 1st communication link zone where each can communicate in the 2nd or 3rd invention, and self has, and a terminal station and a communication link are possible for a control radio station in the 2nd communication link zone which covers the 1st communication link zone of all image radio stations.

[0021] According to the 4th invention, two or more sets of image radio stations can be installed now, it reaches far and wide and image information can be transmitted.

[0022] The 5th invention is set to the 4th invention. Each image radio station Since self is specified, it has the 1st identifier which does not overlap mutually between image radio stations. A control radio station Each image radio station is equipped with a menu information storing means to store the title information on the image information which can be transmitted to a terminal station. A control radio station In order that a terminal station may notify the image information that the image radio station which has the 1st communication link zone which carries out the current position can be transmitted It is characterized by transmitting the identifier currently assigned to each image radio station concerned which can transmit the menu information created based on the title information which the menu information storing means stores, and the image information concerning the title information concerned to the terminal station concerned.

[0023] According to the 5th invention, the transmission signal on a network can be reduced by a video server's not creating menu information, but a control radio station's creating menu information, and transmitting to a terminal office using the 2nd radio channel. By this, a network can make low possibility of lapsing into a congestion condition. It is lost that a video server creates menu information during image information transmission, and the image information transmitted to a terminal office stops furthermore, breaking off.

[0024] The 6th invention is set to the 5th invention. A terminal station It has the 2nd identifier for specifying self, and the 2nd own identifier is also notified to a control radio station by transmitting control information. A control radio station It has further a positional information storing means which shows the current position of the terminal station which transmitted control information for the 2nd identifier and 1st identifier which are notified by the received control information to store as information.

[0025] According to the 6th invention, a control radio station can manage the 1st communication link zone in which a terminal office carries out the current position using the 1st identifier of an image radio station. As for the image radio station which has the 1st communication link zone in which a terminal office carries out the current position by this, image information can be certainly transmitted to the terminal office concerned.

[0026] The 7th invention is further equipped with a location hysteresis information storing means to store the path which the terminal office concerned moved as hysteresis information, in the 6th invention by storing the 2nd identifier and 1st identifier which are notified by the control information concerned whenever a control radio station receives the control information from a terminal office.

[0027] According to the 7th invention, a control radio station stores the 2nd identifier and 1st

identifier which are notified by the control information concerned whenever it receives control information from a terminal office. Therefore, a location hysteresis information storing means will manage the path which the terminal office has moved using the 1st identifier, and can take now the statistics about the moving trucking of the user who carries a terminal office etc.

[0028] The 8th invention is set to the 7th invention. A control radio station It has further a zone map storing means to store the information which shows the 1st communication link zone which adjoins the 1st communication link zone as a zone map. at least -- every -- a control radio station The menu information concerning the title information on the image information which the wireless image station which has the 1st identifier notified by control information, and the wireless image station which has the 1st communication link zone which adjoins the 1st communication link zone which the wireless image station concerned has can transmit is transmitted to a terminal station.

[0029] In case the zone map in which the 1st communication link zone which a control radio station adjoins the 1st communication link zone and this, and is arranged is shown is managed beforehand according to the 8th invention and menu information is transmitted to a terminal station, the terminal station concerned transmits not only the menu information on an image radio station that it has the 1st communication link zone which carries out the current position but the menu information on an image radio station that it has the 1st communication link zone which adjoins this. Response time amount until it becomes unnecessary to transmit menu information for the 1st communication link zone where a terminal office is considered to be located next time and a terminal office acquires menu information by this can be shortened.

[0030] The 9th invention is further equipped with an image hysteresis information storing means to manage the hysteresis of the image information for which the terminal office concerned wished, in the 8th invention by storing the information concerning the image information notified by the control information concerned whenever the control radio station received the control information from a terminal office.

[0031] According to the 9th invention, a control radio station stores the information concerning the image information notified by the control information concerned whenever it receives control information from a terminal office. Therefore, an image hysteresis information storing means can manage the hysteresis of the image information which each terminal office required.

[0032] The 10th invention is further equipped with an image cache means to store a part of image information where self can transmit each image radio station in the 1st – the 9th invention, and each image radio station transmits image information from the image cache means concerned, when the image information answered and transmitted to directions of a control radio station exists in an image cache means.

[0033] According to the 10th invention, the image radio station stores in the image cache means a part of image information which self can transmit, and when the image information answered and transmitted to directions of a control radio station exists in an image cache means, it transmits image information from the image cache means concerned. By this, the image information stored in the image cache means can be transmitted to a terminal office, and response time amount from a demand of the image information by the terminal office to playback can be shortened until an image radio station reads image information from a shared file.

[0034] The 11th invention is set to the 1-10th invention. Each image radio station It has further a proper information storing means to store the image information on a proper the whole image radio station. Each image radio station In the 1st radio channel, the image information on a proper is transmitted using the communication channel defined beforehand, and a terminal station receives the image information on a proper through the communication channel defined beforehand until it transmits control information to a control radio station.

[0035] According to the 11th invention, each image radio station stores the image information on a proper in the proper information storing means the whole image radio station, and when the image information answered and transmitted to directions of a control radio station exists in a proper information storing means, it transmits image information from the proper information storing means concerned. When transmitting directions of the image information on a proper are carried out by this, by it, reading image information of an image radio station from a shared file is

lost. Therefore, the transmission signal on a network can be lessened and possibility that a network lapses into a congestion condition can be made low.

[0036]

[Embodiment of the Invention] Drawing 1 is the block diagram showing the whole wireless image communication system configuration concerning the 1st operation gestalt of this invention. Wireless image communication system is equipped with a video server 1, a network 2, two or more image radio stations 3, at least one control radio station 4, and two or more terminals 5 in drawing 1. A network 2 connects a video server 1, each image radio station 3, and the control radio station 4 mutually possible [a communication link].

[0037] A video server 1 contains the file storing section 11 and the file-sharing section 12. The file storing section 11 stores two or more image information by which picture compression was carried out in conformity with the specification of MPEG1 (Motion Picture Experts Group 1). The file-sharing section 12 is for example, Network System (it is hereafter written as "NFS".) about the image information stored in the file storing section 11. File In addition, "Network File System" and "NFS" are Sun. Micro It is the trademark of Systems. It opens to a network 2 as a file which can be mounted. Since "Internet Engineering Task Force" is describing the protocol of this NFS at "RFC1813" currently exhibited as RFC (Request For Comments), it omits detailed explanation of NFS.

[0038] Each image radio station 3 has the identification number ("ID" is called hereafter) which does not overlap mutually the whole image radio station 3, and contains the file-sharing section 31 and the image information transmitting section 32. By performing NFS mounting, a video server 1 shares the image information stored in the interior on a network 2, reads the image information directed by the control radio station 4, and outputs the file-sharing section 31 to the image information transmitting section 32. The image information transmitting section 32 creates an image information packet (refer to drawing 2 (a)), after dividing the image information which the file-sharing section 31 read into the block of the size which was able to be defined beforehand. Furthermore, the image information packet which is an electrical signal is changed into a lightwave signal, time-division multiplexing etc. carries out this lightwave signal, and it sends out to the 1st radio channel. It is desirable to use light for the 1st radio channel here in consideration of the transmission rate of the magnitude and the high speed of the amount of data of image information being required. Moreover, the image radio station 3 has the 1st communication link zone 6 of a proper, respectively, and transmits an image information packet to the terminal station 5 located in the 1st communication link zone 6 which a local station has. here -- every -- the 1st communication link zone 6 is arranged so that it may not overlap mutually preferably. In addition, among drawing, although two image radio stations 3 are shown, as illustrated in the following explanation, the wireless image stations 3a and 3b are called, and suppose these image radio stations 3a and 3b that it has the 1st communication link zone 6a and 6b.

[0039] The control radio station 4 includes a control section 41, the control information transmitting section 42, and the control information receive section 43. A control section 41 divides all the titles of the image information which the video server 1 stores according to the title of the image information which can distribute the image radio station 3, stores them in the interior, and performs further actuation according to the flow chart mentioned later. Moreover, the control radio station 4 has the 2nd communication link zone 7 of the mode which includes all the 1st communication link zone 6 inside at least, and performs transfer of control information using the 2nd radio channel between the terminal stations 5 located in the 2nd communication link zone 7 concerned. Here, the big image information on the amount of data is not sent out to the 2nd radio channel. Therefore, since the 2nd radio channel does not need broadband nature like the 1st radio channel, an electric wave is used.

[0040] Each terminal station 5 has the identification number ("ID" is called hereafter) which does not overlap mutually, and contains the image information receive section 51, the control information receive section 52, the control information transmitting section 53, and a control section 54. The image information receive section 51 receives the image information packet (refer to drawing 2 (a)) from the image radio station 3 from the 1st radio channel. The control

information receive section 52 receives the control information (thing containing the title of image information etc.) from the control radio station 4. The control information transmitting section 53 transmits an image demand packet (refer to drawing 2 (b)) or a command packet (refer to drawing 2 (c)) to the control radio station 4 through the 2nd radio channel as control information. A control section 54 performs actuation according to the flow chart mentioned later.

[0041] Drawing 2 is drawing showing a format of the packet used in the wireless image communication system concerning this operation gestalt. Drawing 2 (a) shows the format of the image information packet which the image radio station 3 shown in drawing 1 sends out. In drawing 2 (a), an image information packet includes the image radio station ID section 2221, the terminal office ID section 2222, and the image information bureau 2223. ID of the image radio station 3 which transmits an image information packet is stored in the image radio station ID section 2221. ID of the terminal station 5 which receives an image information packet is stored in the terminal station ID section 2222. The block (****) which divided image information is stored in the image information bureau 2223. Drawing 2 (b) is drawing showing a format of the image demand packet which the terminal office 5 shown in drawing 1 sends out. In drawing 2 (b), an image demand packet contains the identification code section 2224, the terminal office ID section 2225, the image radio station ID section 2226, and the demand image section 2227. The 1st identification code for specifying that it is an image demand packet is stored in the identification code section 2224. ID of the terminal station 5 which requires image information by the image demand packet is stored in the terminal station ID section 2225. ID of the image radio station 3 which has the 1st communication link zone 6 in which the terminal station 5 carries out the current position is stored in the image radio station ID section 2226. The title of the image information which the user chose is stored in the demand image section 2227. Drawing 2 (c) shows the format of the command packet which the terminal office 5 shown in drawing 1 transmits. In drawing 2 (c), a command packet contains the identification code section 2228, the terminal office ID section 2229, the image radio station ID section 2230, and the command section 2231. The 2nd identification code for specifying that it is a command packet is stored in the identification code section 2228. ID of the terminal station 5 which created the command packet is stored in the terminal station ID section 2229. ID of the image radio station 3 which should execute the instruction with which the image radio station ID section 2230 is stored in the command section 2231 is stored. The command section 2231 contains the command ("an interruption instruction" is called hereafter) for requiring interruption of transmission of for example, image information etc. In addition, although the command section 2231 may contain other commands, it decides to explain suitably if needed about it. Drawing 2 (d) shows the format of the title demand packet which the terminal office 5 shown in drawing 1 transmits. In drawing 2 (d), a title demand packet contains the identification code section 2232, the terminal office ID section 2233, the image radio station ID section 2234, and the title demand section 2235. The 3rd identification code for specifying that it is a title demand packet is stored in the identification code section 2232. ID of the terminal station 5 to which the terminal station ID section 2233 created the title demand packet is stored. ID of the image radio station 3 which has the 1st communication link zone 6 in which the terminal station 5 carries out the current position is stored in the image radio station ID section 2234. The title demand section 2235 contains the command ("a title demand" is called hereafter) for requiring the title of image information of the control radio station 4.

[0042] Drawing 3 is drawing for explaining actuation of the wireless image communication system shown in drawing 1, and is drawing showing the moving trucking (refer to an arrow head A and B) of the terminal office 5. In drawing 5, the terminal office 5 shall follow a path which is explained below as an example of moving trucking. The terminal station 5 (what attached the dot) was located in the location which is in the 2nd communication link zone 7, and belongs to no 1st communication link zone 6 at the beginning. Then, the terminal station 5 moved (refer to arrow-head A), and advanced into 1st communication link zone 6b. Then, it secedes from the terminal station 5 (what attached the slash) to the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs to no 1st communication link zone 6 again

(refer to arrow-head B).

[0043] Drawing 4 , and 5 and 6 are flow charts which show actuation of the terminal office 5 shown in drawing 1 , the image radio station 3, and the control radio station 4. Hereafter, with reference to drawing 1 –6, actuation of this wireless image communication system is explained to a detail.

[0044] Although the user whom the terminal office 5 carries is in the 2nd communication link zone 7 and was located in the location belonging to no 1st communication link zone 6 at the beginning, it advanced into 1st communication link zone 6b (drawing 3 ; refer to arrow-head A). The image information packet (refer to drawing 2 (a)) changed into the lightwave signal is sent out to 1st communication link zone 6b towards other terminal offices from image radio station 3b.

[0045] The image information receive section 51 of the terminal station 5 receives through the 1st radio channel, and changes and outputs the lightwave signal from image radio station 3b to an electrical signal. Since the control section 54 inputted the electrical signal from the image information receive section 51 (drawing 4 ; step S401), it judges that the electrical signal concerned is an image information packet, and this judges whether it is an image information packet addressed to a local station (step S402). This judgment is made on the terminal station ID section 2222 of an image information packet based on whether ID of a local station is stored. At present, since ID of other terminal stations is stored, a control section 54 shifts to step S403.

[0046] Next, a control section 54 judges whether the title of image information is displayed on the display based on the control state of a display (not shown) etc. (step S403). At present, since the title of image information is not displayed on a display, a control section 54 shifts to step S404. Next, a control section 54 judges whether the title of image information was already required with reference to the flag stored in internal memory (not shown) (step S404). Here, a flag is to show whether the title of image information is demanded, and, at present, not demanding the title of image information is shown. Therefore, a control section 54 shifts to step S405. Next, a control section 54 takes out ID stored in the image radio station ID section 2221 of an image information packet, i.e., ID of image radio station 3b, (step S405). Then, a control section 54 creates a title demand packet (refer to drawing 2 (d)). In this title demand packet, ID of image radio station 3b is stored in the image radio station ID section 2234. Since it is as having mentioned above about other parts 2232, 2233, and 2235, each explanation is omitted. This title demand packet is sent to the control radio station 4 through the 2nd radio channel from the control information transmitting section 53. Thus, the terminal station 5 requires the title of image information (step S406).

[0047] The control information receive section 43 of the control radio station 4 receives the signal from the 2nd radio channel, and outputs to a control section 41. A control section 41 judges whether it is a title demand packet by analyzing the identification code section of the packet which is an input signal (drawing 6 ; step S601). Since the 3rd identification code is stored in the identification code section of this packet, a control section 41 judges that it is a title demand packet, and shifts to step S602. Next, a control section 41 takes out ID of the terminal station 5, and ID of image radio station 3b from the terminal station ID section 2233 of a title demand packet, and the image radio station ID section 2234. A control section 41 chooses the title of the image information which image radio station 3b can transmit from all the titles of the image information managed inside, and outputs it to the control information transmitting section 42. The control information transmitting section 42 sends out the inputted title of image information to the 2nd radio channel. Thus, the control radio station 4 answers a demand from the terminal station 5, and transmits the title of image information to the terminal station 5 (step S602).

[0048] The control section 54 of the terminal office 5 will perform processing of step S402 mentioned above, if the signal which the control information receive section 52 received is inputted (drawing 4 ; step S401). About the signal inputted from the control information receive section 52, a control section 54 does not judge whether it is an image information packet addressed to a local station, but shifts to step S403 immediately. A control section 54 performs

processing of steps S403 and S404 mentioned above. That is, a control section 54 judges that the current title is not displayed (step S403), judges that the title of image information was further already required (step S404), and shifts to step S407. If a control section 54 shifts to step S407, it will judge an input signal to be the title of image information, and will display this on a display (step S407). By this, the user of the terminal station 5 gets the title of the image information to which it can view and listen, i.e., the image information which image radio station 3b can transmit. The user of the terminal station 5 operates an alter operation machine (not shown), and chooses the title of image information to view and listen out of the title of the image information displayed on the display. An alter operation machine outputs the signal which answers actuation of a user and shows the title of the selected image information to a control section 54. A control section 54 inputs the signal from an alter operation machine (step S401). It is judged that this input signal is not an image information packet (step S402). By processing of step S403, a control section 54 shifts to step S408 in order to judge that the current title is displayed (step S403). By this, it judges that a control section 54 is a signal with which an input signal shows the title of image information, and an image demand packet (refer to drawing 2 (b)) is created. In this image demand packet, ID of image radio station 3b is stored in the image radio station ID section 2226. About other parts 2224, 2225, and 2227, since it is the same as that of the above-mentioned, the explanation is omitted. This image demand packet is sent to the control radio station 4 through the 2nd radio channel from the control information transmitting section 53 (step S408).

[0049] The control information receive section 43 of the control radio station 4 receives a packet from the 2nd radio channel, and outputs to a control section 41. Since the 1st identification code is stored in the identification code section of this packet, a control section 41 judges the packet concerned not to be a title demand packet (drawing 6 ; step S601). Next, a control section 41 judges whether the inputted packet is an image demand packet (step S603). Since the 1st identification code is stored in the identification code section of this packet, a control section 41 judges the packet concerned to be an image demand packet. Next, a control section 41 takes out ID of the terminal station stored in the terminal station ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information (step S604). Next, a control section 41 takes out the file name corresponding to the title of the image information taken out by processing of step S604 out of the file name (title of image information) of the shared file managed inside (step S605). Next, a control section 41 outputs ID of the terminal station taken out by processing of step S604, and image radio station 3b, and the file name taken out by processing of step S605 to the control information transmitting section 42. The control information transmitting section 42 outputs ID of the terminal station 5 and image radio station 3b, and a file name to a network 2 that it should notify to image radio station 3b (step S606).

[0050] The file-sharing section 31 of each image radio station 3 will judge whether this signal is a thing addressed to a local station with reference to ID of the image radio station which the signal concerned includes inside, if the signal from a network 2 is received. Therefore, image radio station 3b judges it as the signal addressed to a local station, and performs the following processings. The file-sharing section 31 of image radio station 3b judges whether an interruption instruction is included in an input signal (drawing 5 ; step S501). Since this input signal includes ID and the file name of the terminal station 5 and image radio station 3b and an interruption instruction is not included so that clearly from ****, the file-sharing section 31 shifts to step S502. Next, the file-sharing section 31 opens the shared file corresponding to the file name included in an input signal, and outputs the image information included in this file, and ID of the terminal station 5 contained in the input signal, and image radio station 3b to the image information transmitting section 32. The image information transmitting section 32 will create an image information packet (refer to drawing 2 (a)), if image information etc. is inputted. In this image information packet, ID of image radio station 3b is stored in the image radio station ID section 2221. Since it is as having mentioned above about other parts 2222 and 2223, each explanation is omitted. The image information transmitting section 32 changes and carries out time-division multiplexing of this image information packet to a lightwave signal, uses the 1st

radio channel for the terminal station 5, and transmits to it (step S502).

[0051] As mentioned above, the image information receive section 51 of the terminal station 5 changes the receiving lightwave signal from the 1st radio channel into an electrical signal, and outputs to a control section 54. A control section 54 inputs this electrical signal (drawing 4 ; step S401), and judges that this electrical signal is an image information packet. Next, a control section 54 detects ID of the method local station of terminal station ID section 2222 of this packet, by this, judges that the packet concerned is a thing addressed to a local station (step S402), and shifts to step S409. Next, a control section 54 displays on a display the image information stored in the image information bureau 2223 of an image information packet (step S409). By this, the user of the terminal office 5 can view and listen to the selected image information.

[0052] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. If the image information receive section 51 of the terminal station 5 breaks away in the above locations, it will become receive-not-ready ability about a lightwave signal. A control section 54 will shift to step S410, if the image information receive section 51 detects that it is receive-not-ready ability about an image information packet (step S401). Next, a control section 54 judges whether image information was displayed on the display based on the control state of a display (not shown) etc. (step S410). At present, since a control section 54 judges it as under a display, it shifts to step S411. Next, a control section 54 creates a command packet (refer to drawing 2 (c)). In this command packet, ID of image radio station 3b which should execute "an interruption instruction" (above-mentioned) stored in the command section 2231 is stored in the image radio station ID section 2230. Since it is as having mentioned above about other parts 2280, 2229, and 2231, each explanation is omitted. The control information transmitting section 53 sends out this command packet to the 2nd radio channel (step S411).

[0053] The control information receive section 43 of the control radio station 4 receives the signal from the 2nd radio channel, and outputs to a control section 41. A control section 41 analyzes the identification code section of the packet which is an input signal, it judges that this packet is not a title demand packet (drawing 6 ; step S601), and it is judged further that it is not an image demand packet (step S603). Next, a control section 41 shifts to step S607, and this packet judges whether it is a command packet (step S607). As mentioned above, based on the 2nd identification code, a control section 41 judges a receive packet to be a command packet, and shifts to S608. Next, a control section 41 takes out ID of the terminal station 5 stored in the command packet, and image radio station 3b, and "an interruption instruction", and outputs them to the control information transmitting section 42. The control information transmitting section 42 outputs the terminal station ID, the image radio station ID, and interruption instruction which were inputted to a network 2, and gives interruption advice of an image information packet to image radio station 3b (step S608).

[0054] The input signal from a network 2 judges the file-sharing section 31 of each image radio station 3 like the above-mentioned for whether it is a signal addressed to a local station. Therefore, image radio station 3b judges it as the signal addressed to a local station, and performs processing explained below. The file-sharing section 31 of image radio station 3b judges whether an interruption instruction is included in an input signal (drawing 5 ; step S501). Since the interruption instruction is included in this input signal so that clearly from ****, the file-sharing section 31 shifts to step S503. Next, the file-sharing section 31 performs interruption processing (step S503). That is, the file-sharing section 31 interrupts and closes read-out of the shared file for the terminal stations corresponding to ID of the terminal station contained in an input signal. In connection with this, the image information transmitting section 32 suspends creation of an image information packet.

[0055] Next, when not displaying the image on the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs the inside of image non-display in no 1st communication link zone 6, it seceded from the terminal station 5. If the image information receive section 51 of the terminal station 5 breaks away in the above locations, it

will become receive-not-ready ability about a lightwave signal. If it judges that a control section 54 does not have an input signal from the image information receive section 51 (step S401), it will shift to step S410. Then, it judges whether image information displayed the control section 54 on the display (step S410). Since it judges that a control section 54 is not under display, it shifts to step S412, the display of the title current displayed on a display is terminated (step S412), and it stands by that the image information receive section 51 or the control information receive section 52 receives a transmission signal or a lightwave signal.

[0056] Next, the wireless image communication system concerning the 2nd operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 1st operation gestalt, only points equipped with the control radio station 7 where an internal configuration is different from the control radio station 4 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 1st operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 7 is the block diagram showing the configuration of the control radio station 7 mentioned above. In drawing 7, only the points which contain the communication channel information storing section 71 further differ as compared with the configuration of the control radio station 4 which shows the configuration of the control radio station 7 to drawing 1. Since it is the same about the other configuration, suppose that the same reference number is attached about a corresponding configuration. The communication channel information storing section 71 stores ***** in the operating condition of the communication channel for every image radio station 3. That is, each image radio station 3 has a number of communication channels defined beforehand, and transmits an image information packet to the terminal station 5 using either of this communication channel. the communication channel information storing section 71 is held in the initial state of this system as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has beforehand, respectively, and can set it. The number of empty communication channels is updated whenever a control section 41 inputs an image demand packet or a command packet ("interruption instruction") (it mentions later for details).

[0057] Drawing 8 is a flow chart which shows actuation of the control radio station 7 shown in drawing 7. In drawing 8, the actuation which the control radio station 7 performs differs as compared with actuation of the control radio station 4 shown in drawing 6 at the point which contains further steps S801, S802, S803, and S804. Since it is the same about the other actuation, the same step number is given to a corresponding step, and the explanation is simplified.

[0058] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like the 1st operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0059] If the terminal office 5 advances into 1st communication link zone 6b, the title of image information will be first required of the control radio station 7 (drawing 4; steps S401-S406). Answering this demand, the control radio station 7 transmits the title of image information to the terminal office 5 using the 2nd radio channel (drawing 8; steps S601 and S602). The terminal office 5 displays on a display the title of the image information sent from the control radio station 7 (drawing 4; steps S401-S404, S406). Then, the terminal office 5 transmits an image demand packet that the image information according to a user's hope should be required of image radio station 3b (drawing 4; steps S401-S403 and S408). The control section 41 of the control radio station 7 performs actuation of steps S601 and S603, judges an input signal to be an image demand packet, and shifts to step S604. Next, a control section 41 takes out and holds ID of the terminal station stored in the terminal station ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information (step S604). Next, a control section 41

searches the communication channel information storing section 71, and detects the number of empty channels of image radio station 3b specified by ID of the image radio station taken out at step S604. A control section 41 judges [which detected] whether it is vacant and image radio station 3b has the current opening channel based on the number of channels (step S801). That is, a control section 41 judges that image radio station 3b can meet the image demand from the terminal office 5, if the detected number of empty channels does not show "0." Next, a control section 41 updates the number of empty channels of image radio station 3b in which the communication channel information storing section 71 is carrying out current storing to "-(it detected the number of channels) 1" (step S802). Next, a control section 41 performs processing of steps S605 and S606, and outputs ID of a terminal station, ID of image radio station 3b, and a file name to a network 12 (step S606).

[0060] Only image radio station 3b receives the signal from a network 2. Image radio station 3b performs actuation of steps S501 and S502 shown in drawing 5, and after it changed the created image information packet into the lightwave signal and it carries out Time Division Multiplexing based on the advice from the control radio station 7, it sends it out to the 1st radio channel. If the lightwave signal from the 1st radio channel is received, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 4, and will display image information on a display.

[0061] As mentioned above, the control radio station 7 checks the operating condition of the communication channel of the image radio station 3 which corresponds whenever a Request-to-Send packet receives. At this time, the number of the terminal stations 5 located in 1st communication link zone 6b which image radio station 3b has increases, and suppose that the terminal station 5 of these large number sent out the Request-to-Send packet to the control radio station 7 almost simultaneous. In this case, the control radio station 7 will repeat and perform processing of steps S601, S603, S604, S801, S802, S805, and S606 shown in drawing 8, and the number of empty channels of image radio station 3b which the communication channel information storing section 71 holds becomes small, and is soon set to "0." A control section 41 judges whether image radio station 3b has a current opening channel in step S801. If the detected number of empty channels shows "0" at this time, image radio station 3b will judge that a control section 41 cannot respond the image demand from the terminal office 5, and it will shift to step S803. Next, a control section 41 creates the control information containing this purport and ID of the terminal office concerned in order to notify the purport which cannot receive the Request-to-Send packet of the terminal office 5 concerned to the terminal office 5 which has ID of the terminal office held by actuation of step S604 now. This control information is sent out to the 2nd radio channel from the control information transmitting section 142 (step S803). The terminal office 5 which received this control information displays the purport which cannot receive a Request-to-Send packet on a display (not shown), and notifies a user of this purport. In addition, since processing of the terminal station 5 at this time can be performed simply, that explanation is omitted.

[0062] On the other hand, an image information packet is received now, if the terminal office 5 which is among graphic display comes out of 1st communication link zone 6b, actuation of steps S401, S410, and S411 shown in drawing 4 will be performed, and a command packet (refer to drawing 2 (c)) will be transmitted to the control radio station 7 through the 2nd radio channel. The control radio station 7 which received this command packet performs processing of steps S601, S603, S607, and S608 shown in drawing 8, and notifies it that sending out of an image information packet is interrupted to image radio station 3b. By this, image radio station 3b stops sending out of the image information packet corresponding to this advice, and releases the communication channel used since the image information packet concerned was sent out. A control section 41 performs actuation after [S804] step S608, and takes out ID of image radio station 3b from the image radio station ID section 2230 of a command packet. Next, a control section 41 detects the number of empty channels of image radio station 3b specified by ID of the image radio station which searched and took out the communication channel information storing section 71, and updates the number of empty channels to "+(it detected the number of channels) 1" (step S804).

[0063] Next, the wireless image communication system concerning the 3rd operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 2nd operation gestalt, a point equipped with the control radio station 9 where the control radio station 7 differs from an internal configuration differs from the point that the control radio station 9 transmits not "the title of image information" but "menu information." Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 2nd operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified.

[0064] Drawing 9 is the block diagram showing the configuration of the control radio station 9 mentioned above. In drawing 9, only the points which contain the menu storing section 91 further as compared with the configuration of the control radio station 7 which shows the configuration of the control radio station 9 to drawing 7 differ. Since it is the same about the other configuration, suppose that the same reference number is attached about a corresponding configuration. A video server 1 classifies and stores the title of the image information stored in a network 2 for every thing which can transmit each image radio station 3, and the menu storing section 91 stores further the identification number set up corresponding to object ****.

[0065] Drawing 10 is drawing showing the configuration of the frame format of the menu information packet transmitted from the control radio station 9 shown in drawing 9. A menu information packet contains the terminal station ID section 2236, the number section 2237 of transmitting menus, the menu text section 2238, the menu identification number section 2239, and the image radio station ID section 2240. ID of the terminal station 5 which required the menu information packet is stored in the terminal station ID section 2236. The number of the menu text sections 2238 stored in a menu information packet is stored in the number section 2237 of transmitting menus. The title of image information which can transmit each image radio station 3 is stored in the menu text section 2238. The identification number for specifying the title of each image information stored in the menu text section 2238 is stored in the menu identification number section 2239. ID of the image radio station 3 which can transmit the image information concerning the above-mentioned title is stored in the image radio station ID section 2240.

[0066] Drawing 11 is a flow chart which shows actuation of the terminal office 5 concerning this operation gestalt. In drawing 11, the actuation which the terminal office 5 performs differs at the point which contains step S1101-S1105 further as compared with actuation of the terminal office 5 shown in drawing 4. About the other actuation, since it is the same as that of the actuation shown in drawing 4, the same step number is given to a corresponding step, and the explanation is simplified. Drawing 12 is a flow chart which shows actuation of the control radio station 9 shown in drawing 9. In drawing 12, actuation of the control radio station 9 differs at the point which contains steps S1201-S1204 further as compared with actuation of the control radio station 7 shown in drawing 8. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified.

[0067] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0068] If the terminal station 5 advances into 1st communication link zone 6b, it will receive the lightwave signal from image radio station 3b, and will change it into an electrical signal. A control section 54 inputs this electrical signal (drawing 11 ; step S401), and the electrical signal concerned judges whether it is an image information packet addressed to a local station (step S402). Since ID of other terminal stations is stored in the image information packet, a control section 54 shifts to step S1101. Next, a control section 54 judges whether the menu (the content of the menu test section of a menu information packet) is displayed on the display based on the control state of a display (not shown) etc. (step S1101). At present, since the menu is not displayed on a display, a control section 54 shifts to step S1102. Next, a control

section 54 judges whether the menu was already required with reference to the flag (the same thing as the "flag" in the 1st operation gestalt) stored in internal memory (not shown) (step S1202). Since it shows that the flag is not demanding the menu now, a control section 54 shifts to step S405, and takes out ID of image radio station 3b out of an image information packet (step S405). Then, a control section 54 creates a menu demand packet (it has the same frame format as drawing 2 (d)). In addition, since the identification code stored in each part of a menu demand packet and ID are the same as that of what is stored in a title demand packet in the 1st operation gestalt, the explanation is omitted. However, "a menu demand" is stored in the title demand section 2235. Then, a control section 54 is set up so that having required the menu for the above-mentioned flag may be shown. A menu demand packet is sent to the control radio station 9 through the 2nd radio channel from the control information transmitting section 53. Thus, the terminal station 5 requires a menu from the control radio station 9 (step S1103).

[0069] The control information receive section 43 of the control radio station 9 receives the signal from the 2nd radio channel, and outputs to a control section 41. A control section 41 will search whether menu information is stored in the menu information storing section 91, if this signal is inputted (drawing 12 ; step S1201). A control section 41 judges whether it is a title demand packet by shifting to step S1203 and analyzing the identification code section of the packet which is an input signal, when the menu information storing section 91 judges that menu information is stored (step S1203). Since the 3rd identification code is stored in the identification code section of this packet, a control section 41 judges that it is a menu demand packet, and shifts to step S1204. Next, a control section 41 takes out ID of the terminal station 5, and ID of image radio station 3b from the terminal station ID section 2233 of a menu demand packet, and the image radio station ID section 2234. A control section 41 creates ejection and a menu information packet for the identification number for specifying the title of image information and this which image radio station 3b can transmit out of the menu information storing section 91. In this menu information packet, ID of the terminal station 5 which is demanding current menu information is stored in the terminal station ID section 2236. The number of the menu text sections 2238 is stored in the number section 2237 of transmitting menus. That is, since the number of the menu text sections by which current creation is carried out is one, "1" is stored in the number section 2237 of transmitting menus. The title of image information which can receive within 1st communication link zone 6b, i.e., a menu, is stored in the menu text section 2238. The identification number for specifying the title of each image information is stored in the menu identification number section 2239. ID of image radio station 3b is stored in the image radio station ID section 2240. Thus, the created menu information packet is transmitted to the terminal station 5 by the control information transmitting section 42 through the 2nd radio channel (step S1204).

[0070] If the signal which the control information receive section 52 received is inputted (drawing 11 ; step S401), the control section 54 of the terminal office 5 will perform actuation of step S402 (refer to the 1st operation gestalt), will judge that an input signal is not an image information packet, and will shift to step S1101. A control section 54 performs actuation of steps S1101 and S1102 which is the same actuation as steps S403 and S404 mentioned above. That is, a control section 54 judges that the current menu is not displayed (step S1101), judges that menu information was already required (step S1102), and shifts to step S1104. By this, a control section 54 judges an input signal to be a menu information packet, and the menu contained in this packet is displayed on a display (step S1104). The user of the terminal station 5 operates an alter operation machine (not shown), and chooses the title of image information to view and listen out of the title of the image information displayed on the display. An alter operation machine outputs the signal which answers actuation of a user and shows the title of the selected image information to a control section 54. A control section 54 inputs the signal from an alter operation machine (step S401). It shifts to step S408 in order to judge that the current title is displayed (step S403), after a control section 54 judges this input signal not to be an image information packet (step S402), so that more clearly than the above-mentioned. By this, a control section 54 judges that an input signal is a signal which shows the title of image information, creates an image demand packet (refer to drawing 2 (b)), and transmits (step S408).

In this image demand packet, ID of image radio station 3b is stored in the image radio station ID section 2226, and the identification number corresponding to the title of the image information chosen by the user is stored in the demand image section 2227. About other parts 2224 and 2225, since it is as having mentioned above, those explanation is omitted. This image demand packet is sent to the control radio station 9 through the 2nd radio channel from the control information transmitting section 53.

[0071] The control information receive section 43 of the control radio station 9 receives a packet from the 2nd radio channel, and outputs to a control section 41. After a control section 41 checks that menu information is stored in the menu information storing section 91 (drawing 12 ; step S1201), this packet judges it not to be a menu demand packet (step S1203). Next, a control section 41 judges whether the inputted packet is an image demand packet (step S603). Since the 1st identification code is stored in the identification code section of this packet, a control section 41 judges the packet concerned to be an image demand packet. Next, a control section 41 takes out the identification number for specifying ID of the terminal station stored in the terminal station ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information (step S604). Next, only when a control section 41 performs actuation of steps S801 and S802 explained in full detail in the 2nd operation gestalt, image radio station 3b is vacant as for it and it has the channel, the file name corresponding to the identification number taken out by processing of step S604 is taken out out of the file name (title of image information) of the shared file managed in the new information storing section 91 (step S605). Next, a control section 41 outputs ID of the terminal station taken out by processing of step S604, and image radio station 3b, and the file name taken out by processing of step S605 to the control information transmitting section 42. The control information transmitting section 42 outputs ID and the file name of terminal station and image radio station 3b to a network 2 (step S606).

[0072] If the signal from a network 2 is received, image radio station 3b will perform actuation of steps S501 and S502 shown in drawing 5 the same with having explained in full detail in the 1st operation gestalt, and will create an image information packet (refer to drawing 2 (a)). The image information transmitting section 32 changes and carries out time-division multiplexing of this image information packet to a lightwave signal, uses the 1st radio channel for the terminal station 5, and transmits to it. If the lightwave signal from the 1st radio channel is received as mentioned above, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 1 the same with having explained in full detail in the 1st operation gestalt, and will display image information on a display. By this, the user of the terminal office 5 can view and listen to the selected image information.

[0073] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. In this case, the same with having explained in full detail in the 1st operation gestalt, the terminal office 5 performs actuation of steps S401, S410, and S411, and creates a command packet (refer to drawing 2 (c)). The control information transmitting section 53 sends out this command packet to the 2nd radio channel.

[0074] The control information receive section 43 of the control radio station 9 receives a packet from the 2nd radio channel, and outputs to a control section 41. It is judged that a control section 41 is not a menu demand packet and an image demand packet since the 2nd identification code is stored in this packet after checking that menu information is stored in the menu information storing section 91 (drawing 12 ; step S1201) (steps S1203 and S603). Next, a control section 41 shifts to step S607, and this packet judges that it is a command packet. Next, the same with having explained in full detail in the 2nd operation gestalt, a control section 41 performs actuation of steps S608 and S804, and gives interruption advice of an image information packet to image radio station 3b. The same with having explained in full detail in the 1st operation gestalt, processing of steps S501 and S503 is performed, the advice of interruption from the control radio station 9 answers, and image radio station 3b interrupts and closes read-out of the shared file turned terminal station 5. In connection with this, the image information

transmitting section 32 suspends creation of an image information packet.

[0075] Next, when not displaying the image on the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs the inside of image non-display in no 1st communication link zone 6, it seceded from the terminal station 5. In this case, the terminal station 5 judges a lightwave signal that there is no input signal by becoming receive-not-ready ability (step S401), and shifts to step S410. Then, in order that image information may not display a control section 54 on a display, the display of the menu current displayed on a display is terminated (step S1105).

[0076] Next, the wireless image communication system concerning the 4th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 3rd operation gestalt, only points equipped with the control radio station 13 where an internal configuration is different from the control radio station 9 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 3rd operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 13 is the block diagram showing the configuration of the control radio station 13 mentioned above. In drawing 13, only the points which contain the positional information storing section 131 further differ as compared with the control radio station 9 which shows the control radio station 13 to drawing 9. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The positional information storing section 131 stores the information about the current position of the terminal station 5 concerned using ID of the terminal station 5 sent with a menu demand.

[0077] Drawing 14 is a flow chart which shows actuation of the terminal office 5 concerning this operation gestalt. In drawing 14, the actuation which the terminal office 5 performs differs at the point which contains step S1401 further as compared with actuation of the terminal office 5 shown in drawing 11. About the other actuation, since it is the same as that of the actuation shown in drawing 11, the same step number is given to a corresponding step, and the explanation is simplified. Drawing 15 is a flow chart which shows actuation of the control radio station 13 shown in drawing 13. In drawing 15, actuation of the control radio station 13 differs at the point which contains steps S1501 and S1502 further as compared with actuation of the control radio station 9 shown in drawing 12. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified.

[0078] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0079] If the terminal office 5 advances into 1st communication link zone 6b, menu information will be first required of the control radio station 1501 (drawing 14; steps S401, S402, S1101, S1102, S405, and S1103). Answering this demand, the control radio station 13 transmits the menu information packet created based on menu information to the terminal office 5 using the 2nd radio channel (drawing 15; steps S1201, S1203, and S1204). In addition, when menu information is not stored in the menu information storing section 91, the control radio station 13 transmits a menu information packet, after creating menu information (step S1202). Next, a control section 41 stores in the positional information storing section 131 ID of the terminal station 5 sent with a demand of menu information, and image radio station 13b (step S1501). By this, the control radio station 13 recognizes that the 1st communication link zone 6 in which the terminal station 5 is carrying out the current position is a zone which image radio station 3b has.

[0080] The terminal office 5 displays menu information on a display based on the menu information packet sent from the control radio station 13 (drawing 14; S401, S402, S1101, S1102, and S1104). Then, the terminal office 5 transmits the image demand packet to image radio-station 13b Turn to the control radio station 13 through the 2nd radio channel (drawing

14 ; steps S401, S402, S1101, and S408). By performing actuation of steps S1201, S1203, S603, and S604 shown in drawing 15 , the control section 41 of the control radio station 13 judges the input signal from the 2nd radio channel to be an image demand packet, and takes out and holds further ID of the terminal office stored in the terminal office ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information. Next, a control section 41 detects the number of empty channels of image radio station 3b specified by ID of the image radio station taken out at step S604. A control section 41 updates the detected number of empty channels of image radio station 3b in which the communication channel information storing section 71 will carry out current storing like the 2nd operation gestalt if it is vacant and judges that image radio station 3b has the current opening channel based on the number of channels (step S801) (step S802). Next, a control section 41 performs processing of steps S605 and S606, and outputs ID of a terminal station, ID of image radio station 3b, and a file name to a network 2. In addition, in actuation of step S801, the control section 41 of performing [which detected] actuation of step S803 is the same as that of the 2nd operation gestalt, if it is vacant and the number of channels shows "0."

[0081] As mentioned above, only image radio station 3b receives the signal from a network 2. Image radio station 3b performs processing of steps S501 and S502 shown in drawing 5 , and after it changed the created image information packet 2 into the lightwave signal and it carries out Time Division Multiplexing based on the advice from the control radio station 13, it sends it out to the 1st radio channel. If a lightwave signal is received from the 1st radio channel, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 14 , and will display image information on a display.

[0082] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. If it comes out to the above locations, the terminal office 5 will perform actuation of step S401 shown in drawing 14 , and steps S410 and S411 like the above-mentioned, and will transmit a command packet to the control radio station 13 using the 2nd radio channel. The control radio station 13 updates communication channel information while it performs steps S1201, S1203, S603, S607, S608, and S804 shown in drawing 15 and sends advice of interruption to image radio station 3b. Then, with reference to ID of the terminal station stored in the terminal station ID section 2229 of a command packet, deletion etc. carries out ID of image radio station 3b stored in the positional information storing section 131 at the time of actuation of step S1501, and a control section 41 updates positional information (step S1502). A control section 41 can recognize the terminal office 5 seceding from 1st communication link zone 6b, and being located in neither of the 1st communication link zone 6 by this, now.

[0083] Next, when not displaying the image on the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs the inside of image non-display in no 1st communication link zone 6, it seceded from the terminal station 5. If it comes out to the above locations, the terminal office 5 will perform actuation of steps S401, S410, and S1105 shown in drawing 14 , and will eliminate the menu information displayed on a display. Then, the control section 54 of the terminal office 5 creates the command packet shown in drawing 2 (c) , and transmits to the control radio station 13 using the 2nd radio channel. However, the purport which updates not "an interruption instruction" mentioned above but the positional information stored in the positional information storing section 131 is stored in the command section 2231 of this command packet. By performing the same actuation as step S1702 mentioned above, deletion etc. carries out ID of image radio station 3b stored in the positional information storing section 131 at the time of actuation of step S1501, and the control radio station 13 updates positional information.

[0084] Next, the wireless image communication system concerning the 5th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 4th operation gestalt, only points equipped with the control radio station 16 where an internal configuration is different from the

control radio station 13 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 4th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 16 is the block diagram showing the configuration of the control radio station 16 mentioned above. In drawing 16, only the points which contain the location hysteresis information storing section 161 further differ as compared with the control radio station 16 which shows the control radio station 16 to drawing 13. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The location hysteresis information storing section 161 stores the hysteresis of the information about a path until the terminal station 5 results in current, i.e., location hysteresis information, using the information stored in the positional information storing section 131.

[0085] Drawing 17 is a flow chart which shows actuation of the control radio station 16 shown in drawing 16. In drawing 17, actuation of the control radio station 16 differs as compared with actuation of the control radio station 16 shown in drawing 17 the point which contains step S1701 further, and in that actuation of step S1502 shown in drawing 17 is not performed. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified. In addition, the image radio station 3 and the terminal office 5 concerning this operation gestalt perform actuation shown in drawing 5 and drawing 14. Therefore, actuation of the image radio station 3 and the terminal office 5 is simplified and explained with reference to drawing 11 and drawing 14.

[0086] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0087] If the terminal office 5 advances into 1st communication link zone 6b, menu information will be first required of the control radio station 1501 (drawing 14 ; steps S401, S402, S1101, S1102, S405, and S1103).

[0088] Answering this demand, the control radio station 16 transmits the menu information packet created based on menu information to the terminal office 5 using the 2nd radio channel (drawing 17 ; steps S1201, S1203, and S1204). In addition, when menu information is not stored in the menu information storing section 91, the control radio station 16 transmits a menu information packet, after creating menu information (step S1202). Next, a control section 41 stores the ID concerned as 1st communication link zone 6 located in the field to which ID of the image radio station 3 by which current storing is carried out is stored in the location hysteresis information on the terminal station 5 concerned by the positional information storing section 131 in ejection and the location hysteresis information storing section 161 last time (step S1701). Next, a control section 41 stores in the positional information storing section 131 ID of the terminal station 5 sent with a demand of menu information, and image radio station 13b (step S1501).

[0089] The terminal office 5 displays a menu on a display based on the menu information packet sent from the control radio station 16 (drawing 14 ; S401, S402, S1101, S1102, and S1104). Then, the terminal office 5 transmits the image demand packet to image radio-station 13b Turn to the control radio station 16 through the 2nd radio channel (drawing 14 ; steps S401, S402, S1101, and S408). By performing actuation of steps S1201, S1203, S603, and S604 shown in drawing 17, the control section 41 of the control radio station 16 judges the input signal from the 2nd radio channel to be an image demand packet, and takes out and holds further ID of the terminal office stored in the terminal office ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information. Next, only when image radio station 3b is vacant and it has the channel by performing actuation of steps S801 and S802, a control section 41 performs actuation of steps S605 and S606, and outputs ID of a terminal station, ID of image radio station 3b, and a file name to a network 2. In addition, in actuation of step S801, the control section 41

of performing [which detected] actuation of step S803 is the same as that of the 2nd operation gestalt, if it is vacant and the number of channels shows "0."

[0090] As mentioned above, only image radio station 3b receives the signal from a network 2. Image radio station 3b performs processing of steps S501 and S502 shown in drawing 5, and after it changed the created image information packet 2 into the lightwave signal and it carries out Time Division Multiplexing based on the advice from the control radio station 16, it sends it out to the 1st radio channel. If a lightwave signal is received from the 1st radio channel, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 14, and will display image information on a display.

[0091] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. If it comes out to the above locations, the terminal office 5 will perform actuation of step S401 shown in drawing 14, and steps S410 and S411 like the above-mentioned, and will transmit a command packet to the control radio station 16 using the 2nd radio channel. The control radio station 16 updates communication channel information while it performs steps S1201, S1203, S603, S607, S608, and S804 shown in drawing 17 and sends advice of interruption to image radio station 3b. In addition, since the control radio station 16 enables it to store ID of the image radio station 3 in the location hysteresis information storing section 161 in actuation of next step S1701, it does not perform the same actuation as step S1502 (refer to drawing 15) like the 4th operation gestalt, but stores ID of image radio station 3b in the positional information storing section 131 as it is.

[0092] Next, the inside of image non-display, the terminal station 5 was in the 2nd communication link zone 7 from 1st communication link zone 6b, and when not displaying the image on the location belonging to no 1st communication link zone 6, it came out. If it comes out to the above locations, the terminal office 5 will perform actuation of steps S401, S410, and S1105 shown in drawing 14, and will eliminate the menu information displayed on a display. Then, the control section 54 of the terminal office 5 creates the command packet shown in drawing 2 (c), and transmits to the control radio station 16 using the 2nd radio channel. However, the purport which updates not "an interruption instruction" mentioned above but the positional information stored in the positional information storing section 131 is stored in the command section 2231 of this command packet. In addition, since it enables it to store ID of the image radio station 3 in the location hysteresis information storing section 161 in actuation of next step S1701, the control radio station 16 does not perform the same actuation as step S1502 (refer to drawing 15) like the 4th operation gestalt.

[0093] Next, the wireless image communication system concerning the 6th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 5th operation gestalt, only points equipped with the control radio station 18 where an internal configuration is different from the control radio station 16 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 5th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 18 is the block diagram showing the configuration of the control radio station 18 mentioned above. In drawing 18, only the points which contain the zone map storing section 181 further differ as compared with the control radio station 16 which shows the control radio station 18 to drawing 16. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. the zone map storing section 181 -- every -- the 1st communication link zone 6 and the 1st communication link zone 6 which is alike, respectively and adjoins are managed using the image radio station ID of the image radio station 3.

[0094] Drawing 19 is a flow chart which shows actuation of the control radio station 18 shown in drawing 18. In drawing 19, actuation of the control radio station 18 differs at the point which contains step S1901 further as compared with actuation of the control radio station 16 shown in drawing 17. Drawing 20 is a flow chart which shows actuation of the terminal office 5 concerning this operation gestalt. In drawing 20, the terminal offices 5 differ as compared with actuation of

the terminal office 5 shown in drawing 14 the point of performing actuation of steps S2001 and S2002 further, and in that actuation of step S405 is not performed. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified. In addition, the image radio station 3 concerning this operation gestalt is simplified and explained about the actuation, in order to perform actuation shown in drawing 5.

[0095] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it. Moreover, the terminal station 5 stores in internal memory (not shown) the menu information packet sent last time from the control radio station 18.

[0096] If the terminal station 5 advances into 1st communication link zone 6b, it will judge whether the menu is displayed on the display (steps S401, S402, and S1101). The control section 54 of the terminal station 5 shifts to step S2001 in order to judge at present that the menu is not displayed. A control section 54 detects whether there is ID of image radio station 3b which takes out from the image information packet concerned and is held, when the image information packet for other terminal stations is received in step S401 in the image radio station ID section 2240 of the menu information packet currently held inside current. It is judged that the control section 54 will hold the menu required now if ID of image radio station 3b is detected in the menu information packet currently held in memory (step S2001). In this case, a control section 54 displays a menu required now on ejection out of the menu information packet currently held in memory, and displays this on a display (step S1104). By this, the terminal office 5 can transmit an image demand packet.

[0097] On the other hand, when it is judged that the control section 54 does not hold the menu required now in step S2001, actuation of steps S1102 and S1103 is performed, and a menu is required from the control radio station 18. Answering this demand, the control radio station 16 transmits the menu information packet created based on menu information to the terminal office 5 using the 2nd radio channel (drawing 15 ; steps S1201, S1203, S1901, and S1204). The control radio station 16 creates the menu information on the image radio station 3 which has the communication link zone which adjoins image radio station 3b and 1st communication link zone 6b, creates a menu information packet and transmits it based on this with reference to ID of image radio station 3b sent with a demand of menu information out of the menu information stored in the zone map storing section 181 at this time (step S1901). Therefore, although this menu information packet has the format shown in drawing 10 , only a part with the image radio station 3 which has the communication link zone where the menu text section 2238, the menu identification number section 2239, and the image radio station ID section 2240 adjoin image radio station 3b and 1st communication link zone 6b exists. Therefore, the number of these image radio stations 3 is stored in the number section 2237 of transmitting menus. Then, the control section 41 (a having explained in full detail in the 5th operation gestalt passage performs actuation of steps S1701 and S1501),

[0098] The terminal office 5 displays menu information on a display based on the menu information packet sent from the control radio station 16 (drawing 20 ; S401, S402, S1101, S2001, and S1104). By this, the terminal office 5 can transmit an image demand packet. Furthermore, the control section 54 stores in internal memory the menu information packet transmitted from the control radio station 16.

[0099] Next, the wireless image communication system concerning the 7th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 6th operation gestalt, only points equipped with the control radio station 21 where an internal configuration is different from the control radio station 18 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 6th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing

21 is the block diagram showing the configuration of the control radio station 21 mentioned above. In drawing 21, only the points which contain the image hysteresis information storing section 211 further differ as compared with the control radio station 18 which shows the control radio station 21 to drawing 18. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The image hysteresis information storing section 211 divides and stores the image information which each terminal office 5 received from the image radio station 3 for every terminal office.

[0100] Drawing 22 is a flow chart which shows actuation of the control radio station 21 shown in drawing 21. In drawing 22, actuation of the control radio station 21 differs at the point which contains step S2201 further as compared with actuation of the control radio station 18 shown in drawing 19. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is omitted. In addition, the image radio station 3 and the terminal office 5 concerning this operation gestalt simplify the explanation about actuation, respectively, in order to perform actuation shown in drawing 5 and drawing 20.

[0101] If the image demand packet from the terminal office 5 is received, the control radio station 21 will perform actuation of steps S1201, S1203, S603, S604, S801, S802, and S605 shown in drawing 22 like the 6th operation gestalt etc., in order that it may notify the terminal office ID and a file name to image radio station 3b. Then, the control section 41 of the control radio station 21 stores a title in the field to which the title of the image information stored in the demand image section 2227 of an image demand packet is stored in the image hysteresis information on this terminal station 5 in ejection and the image hysteresis information storing section 211 for the taken-out image information (step S2201). Then, a control section 41 performs actuation of step S606, and notifies the terminal station ID and a file name to image radio station 3b.

[0102] Next, the wireless image communication system concerning the 8th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 7th operation gestalt, only points equipped with the image radio station 23 where an internal configuration is different from the image radio station 3 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 7th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 23 is the block diagram showing the configuration of the image radio station 23 mentioned above. In drawing 23, only the points which contain the image cache section 231 further differ as compared with the control radio station 3 which shows the image radio station 23 to drawing 1. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The image cache section 231 consists of the storage elements or recording devices in which rapid access is possible, and stores a part of shared file which is image information.

[0103] Drawing 24 is a flow chart which shows actuation of the image radio station 23 shown in drawing 23. As compared with actuation of the image radio station 3 which showed actuation of the image radio station 23 to drawing 5 in drawing 24, it is the point (it differs in that actuation of step S502 is not performed.) of performing steps S2401-S2411 further. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is omitted. Moreover, the control radio station 21 and the terminal office 5 concerning this operation gestalt perform actuation shown in drawing 21 and drawing 14. Therefore, it omits about actuation of the image radio station 21 and the terminal station 5.

[0104] If the image radio station 23 receives ID and the file name of the terminal station notified from the control radio station 21, and an image radio station through a network 2, this will judge whether it is advice addressed to a local station like an old operation gestalt. Suppose that it was judged like the old operation gestalt that image radio station 223b was advice addressed to a local station at this time. Image radio station 223b performs first actuation of step S501 shown in drawing 24, judges that this advice is not interruption directions, and shifts to step S2401. Next, the file-sharing section 31 opens the shared file corresponding to the file name included in

an input signal (advice from the control radio station 21) (step S2401). ** is judged [whether the image cache section 231 has whether the file corresponding to the file name included in an input signal is stored in the interior, and the directed image information that is, in the image cache section 231, and] in order that this opening may require some time amount next (step S2402). If it judges that the image cache section 231 does not store the file concerning the interior at this time, it will shift to step S2403. That is, after the shared file section 31 reads a shared file (step S2403), this is outputted to the image information transmitting section 32. The image information transmitting section 32 creates an image information packet like an old operation gestalt, and transmits to the terminal station 5 (step S2404). Moreover, a part of shared file in which reading appearance was carried out by the shared file section 31 is stored in the image cache section 231 a sake [when transmission of the same file is directed next time].

[0105] Thus, when the file is stored in the image cache section 231 (i.e., when it is judged that the directed image information is in the image cache section 231 in actuation of step S2401), image radio station 23b shifts to step S2405. After opening and (step S2405) reading the file which image radio station 23b was stored in the image cache section 231, and was directed at this time (step S2406), this file is outputted to the image information transmitting section 32. Based on the inputted file, the image information transmitting section 32 creates an image information packet, and transmits to the terminal station 5 (step S2407). Then, image radio station 23b judges a shared file for whether read-out became possible from the file-sharing section 31 (step S2408). If image radio station 23b judges that this read-out cannot be performed, when it will repeat and perform actuation of steps S2406-S2407 and the read-out concerned of it will become possible, it interrupts read-out from the image cache section 231, and shifts to step S2403.

[0106] Next, the wireless image communication system concerning the 9th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 8th operation gestalt, only points equipped with the image radio station 25 where an internal configuration is different from the image radio station 23 differ. Therefore, the graphic display of the whole configuration of this system is omitted. Moreover, except this point of difference, the reference number same about the configuration explained in the 8th operation gestalt and the configuration which corresponds since it is the same is attached, and the explanation of those other than this point of difference is omitted. Drawing 25 is the block diagram showing the configuration of the image radio station 25 mentioned above. In drawing 25, only the points which contain the proper image information storing section 251 further differ as compared with the control radio station 23 which shows the image radio station 25 to drawing 23. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The proper image information storing section 251 consists of a storage element or a recording apparatus, and stores the image information on the proper which has relation only in the image radio station 3 which contains the proper image information storing section 251 concerned among all the image information stored in the image information storing section 11 of a video server 1.

[0107] Drawing 26 is a flow chart which shows actuation of the image radio station 25 shown in drawing 25. In drawing 26, actuation of the image radio station 25 differs at the point which contains steps S2601-S26 further as compared with actuation of the image radio station 23 shown in drawing 24. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified. In addition, the control radio station 21 and the terminal office 5 concerning this operation gestalt perform actuation shown in drawing 21 and drawing 14. Therefore, explanation of actuation of the image radio station 21 and the terminal station 5 is omitted.

[0108] If the image radio station 25 receives ID and the file name of the terminal station notified from the control radio station 21, and an image radio station through a network 2, this will judge whether it is advice addressed to a local station like an old operation gestalt. Suppose that it was judged like the old operation gestalt that image radio station 25b was advice addressed to a local station at this time. Image radio station 25b performs first actuation of step S501 shown in drawing 24, judges that this advice is not interruption directions, and shifts to step S2601. Next,

image radio station 3b judges whether the image information corresponding to the file name included in an input signal (advice from the control radio station 21) is stored in the proper information storing section 251 (step S2601). If it judges that the proper information storing section 251 does not store the file concerning the interior at this time, as it explained in the 8th operation gestalt, an image information packet will be created and it will transmit (steps S2403 and S2404, steps S2405-S2408). When the shared file reading appearance was carried out [the shared file] by the shared file section 31 is the image information on a proper at this time, it is stored in the proper information storing section 251 a sake [when transmission of the same file is directed next time].

[0109] Thus, when the image information on a proper is stored in the proper image information storing section 251 (i.e., when it is judged that the directed image information is in the proper information storing section 2601 in actuation of step S2601), image radio station 25b shifts to step S2602. After opening and (step S2602) reading the file which image radio station 25b was stored in the proper image information storing section 251, and was directed at this time (step S2603), this file is outputted to the image information transmitting section 32. Based on the inputted file, the image information transmitting section 32 creates an image information packet, and transmits to the terminal station 5 (step S2604).

[Translation done.]

* NOTICES *

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TECHNICAL FIELD

[Field of the Invention] More specifically, this invention relates to the wireless image communication system which transmits various image information using a radio channel to a movable terminal station about wireless image communication system.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] Drawing 27 is the block diagram showing the example of 1 configuration of the conventional wireless image communication system. Wireless image communication system is equipped with a video server 271, the image information junction section 273 connected to the video server 271 through the network 272, two or more wireless LAN base stations 275, and two or more wireless image terminals 277 in drawing 27 . Each wireless LAN base station 275 has the communication link zone 276 of a proper, and is constituted possible [the wireless image terminal 277 located in the communication link zone 276 which a local station has, and a communication link]. The wireless LAN base station 275 which has the communication link zone 276 which is movable and carries out the current position of the service area freely from all the communication link zones 276, and a communication link are possible for the wireless image terminal 277. Hereafter, the configuration of each part of this wireless image communication system is explained more to a detail.

[0003] A video server 271 transmits the menu information containing the title of image information etc. to all the wireless LAN base stations 275 so that the wireless image terminal 277 can retrieve the image information stored in the interior. Moreover, a video server 271 answers a demand from the wireless image terminal 277, and distributes the image information stored in the interior to the wireless image terminal 277. A network 272 transmits the menu information and image information which are transmitted from a video server 271 to the image information junction section 273. Moreover, a network 272 transmits the control information collected by the image information junction section 273 to a video server 271.

[0004] The image information junction section 273 receives the menu information and image information which the video server 271 transmitted through a network 272, and distributes them to each wireless LAN base station 275 according to the content of the received menu information or image information. Moreover, the image information junction section 273 collects the control information from each wireless image terminal 277 transmitted from each wireless LAN base station 275, and outputs it to a network 272 that it should transmit to a video server 271.

[0005] Each wireless LAN base station 275 transmits menu information and image information to the wireless image terminal 277 directly. Moreover, the wireless LAN base station 275 collects the control information transmitted from the wireless image terminal 277 located in the communication link zone 276 of a proper, and outputs it to the image information junction section 273. The wireless image terminal 277 outputs the control information containing the Request to Send of the image information determined to the video server 271 to the wireless LAN base station 275, after determining the image information which wishes to transmit from the menu information distributed from the wireless LAN base station 275. Moreover, the wireless image terminal 277 reproduces as an image etc. the image information which carried out the Request to Send to the video server 271.

[0006] In the wireless image communication system which has the above configurations, a procedure until the wireless image terminal 277 receives distribution of image information from a video server 271 is hereafter explained to a detail. As mentioned above, a video server 271 outputs the menu information corresponding to all the wireless LAN base stations 275. The

image information junction section 273 distributes the menu information which inputted menu information through the network 272 every wireless LAN base station 275, and outputs it to the corresponding wireless LAN base station 275. Each wireless LAN base station 275 is sent out to the communication link zone 276 where a local station has the menu information inputted from the image information junction section 273.

[0007] The wireless image terminal 277 receives the menu information sent out in the communication link zone 276 concerned, when it advances into the communication link zone 276. Into the received menu information, if the wireless image terminal 277 has the image information which wishes to transmit, it will generate the control information containing the Request to Send of the image information concerned, and will output it in the wireless LAN base station 275. This control information is transmitted in the wireless LAN base station 275, the image information junction section 273, and a network 272, and is received by the video server 271. A video server 271 will recognize that the wireless image terminal 277 is demanding transmission of image information, if control information is received. A video server 271 retrieves the image information stored in the interior, outputs the image information which the wireless image terminal 277 is demanding to ejection, and outputs the image information concerned to a network 272. This image information is transmitted, depends a network 272, the image information junction section 273, and the wireless LAN base station 275 wireless image terminal 277, and is received. The wireless image terminal 277 outputs the received image information as an image etc.

[Translation done.]

* NOTICES *

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- 2.**** shows the word which can not be translated.
3. In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[The means for solving a technical problem and effectiveness] As for the 1st invention, the video server, the control radio station, and the image radio station are connected through the network. It is the wireless image communication system which distributes various image information on radio to a movable terminal station. A video server Two or more kinds of image information that two or more kinds of image information is stored in the interior is offered as a shared file on a network. A terminal station The image information the purport and self which require transmission of image information by transmitting control information to a control radio station through the 2nd radio channel expect reception is notified. A control radio station It directs to an image radio station through a network so that the image information the terminal station expects reception may be transmitted based on the control information received through the 2nd radio channel. An image radio station Are sharing on a network the image information which a video server stores as a shared file, and the image information corresponding to the directions from a control radio station is read from a shared file. Outputting to the 1st radio channel which is a wide band as compared with the 2nd radio channel, a terminal station receives the image information which the image radio station outputted through the 1st radio channel.

[0015] According to the 1st invention, a control radio station receives the control information from the terminal station from the 2nd radio channel, and an image radio station transmits image information to a terminal station using the 1st radio channel. Thus, an image radio station should play only the role of transmitting image information, by changing the channel which a control radio station and an image radio station use. Therefore, the load of an image radio station becomes low. Furthermore, in order that an image radio station may share image information as a shared file on a network by the video server, an unnecessary transmission signal is not sent out on a network. By this, a network can make low possibility of lapsing into a congestion condition.

[0016] The 2nd invention is set to the 1st invention. An image radio station In order to transmit image information to a terminal station, are usable in two or more communication channels within the 1st radio channel. A control radio station When the current operating condition of a communication channel is supervised and the control information from a terminal station is received, Only when it judges whether an image radio station has a communication channel usable now and judges that an image radio station has a communication channel usable now, it is characterized by directing to transmit the image information the terminal station expects reception to the image radio station concerned.

[0017] According to the 2nd invention, two or more communication channels are prepared in each image radio station. The control radio station has managed the operating condition of the communication channel by each image radio station, and only when it judges that an image radio station has a communication channel usable now, it directs that it transmits the image information the terminal station expects reception to the image radio station concerned. That is, when an image radio station does not have a communication channel usable now, even if there is a demand of image information from a terminal station, transmission of the image information will not be directed to an image radio station. Therefore, it is lost that an unnecessary signal is sent out on a network and possibility that a network lapses into a congestion condition by this can be made low.

[0018] 3rd invention is characterized by a control radio station notifying the purport which cannot transmit the image information the terminal office concerned expects reception to the terminal office which has transmitted control information, when it judges that an image radio station does not have a communication channel usable now in the 2nd invention.

[0019] According to the 3rd invention, a control radio station notifies the purport which cannot transmit the image information the terminal office concerned expects reception to the terminal office which has transmitted control information, when it judges that an image radio station does not have a communication channel usable now. By this advice, a terminal office can notify again the image information the purport and self which require transmission of image information by transmitting control information to a control radio station through the 2nd radio channel expect reception, and user-friendly wireless image communication system can be offered now.

[0020] The 4th invention transmits image information to the terminal station located in the communication link zone which two or more image radio stations are installed, and has the 1st communication link zone where each can communicate in the 2nd or 3rd invention, and self has, and a terminal station and a communication link are possible for a control radio station in the 2nd communication link zone which covers the 1st communication link zone of all image radio stations.

[0021] According to the 4th invention, two or more sets of image radio stations can be installed now, it reaches far and wide and image information can be transmitted.

[0022] The 5th invention is set to the 4th invention. Each image radio station Since self is specified, it has the 1st identifier which does not overlap mutually between image radio stations. A control radio station Each image radio station is equipped with a menu information storing means to store the title information on the image information which can be transmitted to a terminal station. A control radio station In order that a terminal station may notify the image information that the image radio station which has the 1st communication link zone which carries out the current position can be transmitted It is characterized by transmitting the identifier currently assigned to each image radio station concerned which can transmit the menu information created based on the title information which the menu information storing means stores, and the image information concerning the title information concerned to the terminal station concerned.

[0023] According to the 5th invention, the transmission signal on a network can be reduced by a video server's not creating menu information, but a control radio station's creating menu information, and transmitting to a terminal office using the 2nd radio channel. By this, a network can make low possibility of lapsing into a congestion condition. It is lost that a video server creates menu information during image information transmission, and the image information transmitted to a terminal office stops furthermore, breaking off.

[0024] The 6th invention is set to the 5th invention. A terminal station It has the 2nd identifier for specifying self, and the 2nd own identifier is also notified to a control radio station by transmitting control information. A control radio station It has further a positional information storing means which shows the current position of the terminal station which transmitted control information for the 2nd identifier and 1st identifier which are notified by the received control information to store as information.

[0025] According to the 6th invention, a control radio station can manage the 1st communication link zone in which a terminal office carries out the current position using the 1st identifier of an image radio station. As for the image radio station which has the 1st communication link zone in which a terminal office carries out the current position by this, image information can be certainly transmitted to the terminal office concerned.

[0026] The 7th invention is further equipped with a location hysteresis information storing means to store the path which the terminal office concerned moved as hysteresis information, in the 6th invention by storing the 2nd identifier and 1st identifier which are notified by the control information concerned whenever a control radio station receives the control information from a terminal office.

[0027] According to the 7th invention, a control radio station stores the 2nd identifier and 1st identifier which are notified by the control information concerned whenever it receives control

information from a terminal office. Therefore, a location hysteresis information storing means will manage the path which the terminal office has moved using the 1st identifier, and can take now the statistics about the moving trucking of the user who carries a terminal office etc.

[0028] The 8th invention is set to the 7th invention. A control radio station It has further a zone map storing means to store the information which shows the 1st communication link zone which adjoins the 1st communication link zone as a zone map. at least — every — a control radio station The menu information concerning the title information on the image information which the wireless image station which has the 1st identifier notified by control information, and the wireless image station which has the 1st communication link zone which adjoins the 1st communication link zone which the wireless image station concerned has can transmit is transmitted to a terminal station.

[0029] In case the zone map in which the 1st communication link zone which a control radio station adjoins the 1st communication link zone and this, and is arranged is shown is managed beforehand according to the 8th invention and menu information is transmitted to a terminal station, the terminal station concerned transmits not only the menu information on an image radio station that it has the 1st communication link zone which carries out the current position but the menu information on an image radio station that it has the 1st communication link zone which adjoins this. Response time amount until it becomes unnecessary to transmit menu information for the 1st communication link zone where a terminal office is considered to be located next time and a terminal office acquires menu information by this can be shortened.

[0030] The 9th invention is further equipped with an image hysteresis information storing means to manage the hysteresis of the image information for which the terminal office concerned wished, in the 8th invention by storing the information concerning the image information notified by the control information concerned whenever the control radio station received the control information from a terminal office.

[0031] According to the 9th invention, a control radio station stores the information concerning the image information notified by the control information concerned whenever it receives control information from a terminal office. Therefore, an image hysteresis information storing means can manage the hysteresis of the image information which each terminal office required.

[0032] The 10th invention is further equipped with an image cache means to store a part of image information where self can transmit each image radio station in the 1st – the 9th invention, and each image radio station transmits image information from the image cache means concerned, when the image information answered and transmitted to directions of a control radio station exists in an image cache means.

[0033] According to the 10th invention, the image radio station stores in the image cache means a part of image information which self can transmit, and when the image information answered and transmitted to directions of a control radio station exists in an image cache means, it transmits image information from the image cache means concerned. By this, the image information stored in the image cache means can be transmitted to a terminal office, and response time amount from a demand of the image information by the terminal office to playback can be shortened until an image radio station reads image information from a shared file.

[0034] The 11th invention is set to the 1–10th invention. Each image radio station It has further a proper information storing means to store the image information on a proper the whole image radio station. Each image radio station In the 1st radio channel, the image information on a proper is transmitted using the communication channel defined beforehand, and a terminal station receives the image information on a proper through the communication channel defined beforehand until it transmits control information to a control radio station.

[0035] According to the 11th invention, each image radio station stores the image information on a proper in the proper information storing means the whole image radio station, and when the image information answered and transmitted to directions of a control radio station exists in a proper information storing means, it transmits image information from the proper information storing means concerned. When transmitting directions of the image information on a proper are carried out by this, by it, reading image information of an image radio station from a shared file is lost. Therefore, the transmission signal on a network can be lessened and possibility that a

network lapses into a congestion condition can be made low.

[0036]

[Embodyment of the Invention] Drawing 1 is the block diagram showing the whole wireless image communication system configuration concerning the 1st operation gestalt of this invention. Wireless image communication system is equipped with a video server 1, a network 2, two or more image radio stations 3, at least one control radio station 4, and two or more terminals 5 in drawing 1. A network 2 connects a video server 1, each image radio station 3, and the control radio station 4 mutually possible [a communication link].

[0037] A video server 1 contains the file storing section 11 and the file-sharing section 12. The file storing section 11 stores two or more image information by which picture compression was carried out in conformity with the specification of MPEG1 (Motion Picture Experts Group 1). The file-sharing section 12 is for example, Network System (it is hereafter written as "NFS".) about the image information stored in the file storing section 11. File In addition, "Network File System" and "NFS" are Sun. Micro It is the trademark of Systems. It opens to a network 2 as a file which can be mounted. Since "Internet Engineering Task Force" is describing the protocol of this NFS at "RFC1813" currently exhibited as RFC (Request For Comments), it omits detailed explanation of NFS.

[0038] Each image radio station 3 has the identification number ("ID" is called hereafter) which does not overlap mutually the whole image radio station 3, and contains the file-sharing section 31 and the image information transmitting section 32. By performing NFS mounting, a video server 1 shares the image information stored in the interior on a network 2, reads the image information directed by the control radio station 4, and outputs the file-sharing section 31 to the image information transmitting section 32. The image information transmitting section 32 creates an image information packet (refer to drawing 2 (a)), after dividing the image information which the file-sharing section 31 read into the block of the size which was able to be defined beforehand. Furthermore, the image information packet which is an electrical signal is changed into a lightwave signal, time-division multiplexing etc. carries out this lightwave signal, and it sends out to the 1st radio channel. It is desirable to use light for the 1st radio channel here in consideration of the transmission rate of the magnitude and the high speed of the amount of data of image information being required. Moreover, the image radio station 3 has the 1st communication link zone 6 of a proper, respectively, and transmits an image information packet to the terminal station 5 located in the 1st communication link zone 6 which a local station has. here — every — the 1st communication link zone 6 is arranged so that it may not overlap mutually preferably. In addition, among drawing, although two image radio stations 3 are shown, as illustrated in the following explanation, the wireless image stations 3a and 3b are called, and suppose these image radio stations 3a and 3b that it has the 1st communication link zone 6a and 6b.

[0039] The control radio station 4 includes a control section 41, the control information transmitting section 42, and the control information receive section 43. A control section 41 divides all the titles of the image information which the video server 1 stores according to the title of the image information which can distribute the image radio station 3, stores them in the interior, and performs further actuation according to the flow chart mentioned later. Moreover, the control radio station 4 has the 2nd communication link zone 7 of the mode which includes all the 1st communication link zone 6 inside at least, and performs transfer of control information using the 2nd radio channel between the terminal stations 5 located in the 2nd communication link zone 7 concerned. Here, the big image information on the amount of data is not sent out to the 2nd radio channel. Therefore, since the 2nd radio channel does not need broadband nature like the 1st radio channel, an electric wave is used.

[0040] Each terminal station 5 has the identification number ("ID" is called hereafter) which does not overlap mutually, and contains the image information receive section 51, the control information receive section 52, the control information transmitting section 53, and a control section 54. The image information receive section 51 receives the image information packet (refer to drawing 2 (a)) from the image radio station 3 from the 1st radio channel. The control information receive section 52 receives the control information (thing containing the title of

image information etc.) from the control radio station 4. The control information transmitting section 53 transmits an image demand packet (refer to drawing 2 (b)) or a command packet (refer to drawing 2 (c)) to the control radio station 4 through the 2nd radio channel as control information. A control section 54 performs actuation according to the flow chart mentioned later.

[0041] Drawing 2 is drawing showing a format of the packet used in the wireless image communication system concerning this operation gestalt. Drawing 2 (a) shows the format of the image information packet which the image radio station 3 shown in drawing 1 sends out. In drawing 2 (a), an image information packet includes the image radio station ID section 2221, the terminal office ID section 2222, and the image information bureau 2223. ID of the image radio station 3 which transmits an image information packet is stored in the image radio station ID section 2221. ID of the terminal station 5 which receives an image information packet is stored in the terminal station ID section 2222. The block (****) which divided image information is stored in the image information bureau 2223. Drawing 2 (b) is drawing showing a format of the image demand packet which the terminal office 5 shown in drawing 1 sends out. In drawing 2 (b), an image demand packet contains the identification code section 2224, the terminal office ID section 2225, the image radio station ID section 2226, and the demand image section 2227. The 1st identification code for specifying that it is an image demand packet is stored in the identification code section 2224. ID of the terminal station 5 which requires image information by the image demand packet is stored in the terminal station ID section 2225. ID of the image radio station 3 which has the 1st communication link zone 6 in which the terminal station 5 carries out the current position is stored in the image radio station ID section 2226. The title of the image information which the user chose is stored in the demand image section 2227. Drawing 2 (c) shows the format of the command packet which the terminal office 5 shown in drawing 1 transmits. In drawing 2 (c), a command packet contains the identification code section 2228, the terminal office ID section 2229, the image radio station ID section 2230, and the command section 2231. The 2nd identification code for specifying that it is a command packet is stored in the identification code section 2228. ID of the terminal station 5 which created the command packet is stored in the terminal station ID section 2229. ID of the image radio station 3 which should execute the instruction with which the image radio station ID section 2230 is stored in the command section 2231 is stored. The command section 2231 contains the command ("an interruption instruction" is called hereafter) for requiring interruption of transmission of for example, image information etc. In addition, although the command section 2231 may contain other commands, it decides to explain suitably if needed about it. Drawing 2 (d) shows the format of the title demand packet which the terminal office 5 shown in drawing 1 transmits. In drawing 2 (d), a title demand packet contains the identification code section 2232, the terminal office ID section 2233, the image radio station ID section 2234, and the title demand section 2235. The 3rd identification code for specifying that it is a title demand packet is stored in the identification code section 2232. ID of the terminal station 5 to which the terminal station ID section 2233 created the title demand packet is stored. ID of the image radio station 3 which has the 1st communication link zone 6 in which the terminal station 5 carries out the current position is stored in the image radio station ID section 2234. The title demand section 2235 contains the command ("a title demand" is called hereafter) for requiring the title of image information of the control radio station 4.

[0042] Drawing 3 is drawing for explaining actuation of the wireless image communication system shown in drawing 1, and is drawing showing the moving trucking (refer to an arrow head A and B) of the terminal office 5. In drawing 5, the terminal office 5 shall follow a path which is explained below as an example of moving trucking. The terminal station 5 (what attached the dot) was located in the location which is in the 2nd communication link zone 7, and belongs to no 1st communication link zone 6 at the beginning. Then, the terminal station 5 moved (refer to arrow-head A), and advanced into 1st communication link zone 6b. Then, it secedes from the terminal station 5 (what attached the slash) to the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs to no 1st communication link zone 6 again (refer to arrow-head B).

[0043] Drawing 4, and 5 and 6 are flow charts which show actuation of the terminal office 5 shown in drawing 1, the image radio station 3, and the control radio station 4. Hereafter, with reference to drawing 1 – 6, actuation of this wireless image communication system is explained to a detail.

[0044] Although the user whom the terminal office 5 carries is in the 2nd communication link zone 7 and was located in the location belonging to no 1st communication link zone 6 at the beginning, it advanced into 1st communication link zone 6b (drawing 3 ; refer to arrow-head A). The image information packet (refer to drawing 2 (a)) changed into the lightwave signal is sent out to 1st communication link zone 6b towards other terminal offices from image radio station 3b.

[0045] The image information receive section 51 of the terminal station 5 receives through the 1st radio channel, and changes and outputs the lightwave signal from image radio station 3b to an electrical signal. Since the control section 54 inputted the electrical signal from the image information receive section 51 (drawing 4 ; step S401), it judges that the electrical signal concerned is an image information packet, and this judges whether it is an image information packet addressed to a local station (step S402). This judgment is made on the terminal station ID section 2222 of an image information packet based on whether ID of a local station is stored. At present, since ID of other terminal stations is stored, a control section 54 shifts to step S403.

[0046] Next, a control section 54 judges whether the title of image information is displayed on the display based on the control state of a display (not shown) etc. (step S403). At present, since the title of image information is not displayed on a display, a control section 54 shifts to step S404. Next, a control section 54 judges whether the title of image information was already required with reference to the flag stored in internal memory (not shown) (step S404). Here, a flag is to show whether the title of image information is demanded, and, at present, not demanding the title of image information is shown. Therefore, a control section 54 shifts to step S405. Next, a control section 54 takes out ID stored in the image radio station ID section 2221 of an image information packet, i.e., ID of image radio station 3b, (step S405). Then, a control section 54 creates a title demand packet (refer to drawing 2 (d)). In this title demand packet, ID of image radio station 3b is stored in the image radio station ID section 2234. Since it is as having mentioned above about other parts 2232, 2233, and 2235, each explanation is omitted. This title demand packet is sent to the control radio station 4 through the 2nd radio channel from the control information transmitting section 53. Thus, the terminal station 5 requires the title of image information (step S406).

[0047] The control information receive section 43 of the control radio station 4 receives the signal from the 2nd radio channel, and outputs to a control section 41. A control section 41 judges whether it is a title demand packet by analyzing the identification code section of the packet which is an input signal (drawing 6 ; step S601). Since the 3rd identification code is stored in the identification code section of this packet, a control section 41 judges that it is a title demand packet, and shifts to step S602. Next, a control section 41 takes out ID of the terminal station 5, and ID of image radio station 3b from the terminal station ID section 2233 of a title demand packet, and the image radio station ID section 2234. A control section 41 chooses the title of the image information which image radio station 3b can transmit from all the titles of the image information managed inside, and outputs it to the control information transmitting section 42. The control information transmitting section 42 sends out the inputted title of image information to the 2nd radio channel. Thus, the control radio station 4 answers a demand from the terminal station 5, and transmits the title of image information to the terminal station 5 (step S602).

[0048] The control section 54 of the terminal office 5 will perform processing of step S402 mentioned above, if the signal which the control information receive section 52 received is inputted (drawing 4 ; step S401). About the signal inputted from the control information receive section 52, a control section 54 does not judge whether it is an image information packet addressed to a local station, but shifts to step S403 immediately. A control section 54 performs processing of steps S403 and S404 mentioned above. That is, a control section 54 judges that

the current title is not displayed (step S403), judges that the title of image information was further already required (step S404), and shifts to step S407. If a control section 54 shifts to step S407, it will judge an input signal to be the title of image information, and will display this on a display (step S407). By this, the user of the terminal station 5 gets the title of the image information to which it can view and listen, i.e., the image information which image radio station 3b can transmit. The user of the terminal station 5 operates an alter operation machine (not shown), and chooses the title of image information to view and listen out of the title of the image information displayed on the display. An alter operation machine outputs the signal which answers actuation of a user and shows the title of the selected image information to a control section 54. A control section 54 inputs the signal from an alter operation machine (step S401). It is judged that this input signal is not an image information packet (step S402). By processing of step S403, a control section 54 shifts to step S408 in order to judge that the current title is displayed (step S403). By this, it judges that a control section 54 is a signal with which an input signal shows the title of image information, and an image demand packet (refer to drawing 2 (b)) is created. In this image demand packet, ID of image radio station 3b is stored in the image radio station ID section 2226. About other parts 2224, 2225, and 2227, since it is the same as that of the above-mentioned, the explanation is omitted. This image demand packet is sent to the control radio station 4 through the 2nd radio channel from the control information transmitting section 53 (step S408).

[0049] The control information receive section 43 of the control radio station 4 receives a packet from the 2nd radio channel, and outputs to a control section 41. Since the 1st identification code is stored in the identification code section of this packet, a control section 41 judges the packet concerned not to be a title demand packet (drawing 6 ; step S601). Next, a control section 41 judges whether the inputted packet is an image demand packet (step S603). Since the 1st identification code is stored in the identification code section of this packet, a control section 41 judges the packet concerned to be an image demand packet. Next, a control section 41 takes out ID of the terminal station stored in the terminal station ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information (step S604). Next, a control section 41 takes out the file name corresponding to the title of the image information taken out by processing of step S604 out of the file name (title of image information) of the shared file managed inside (step S605). Next, a control section 41 outputs ID of the terminal station taken out by processing of step S604, and image radio station 3b, and the file name taken out by processing of step S605 to the control information transmitting section 42. The control information transmitting section 42 outputs ID of the terminal station 5 and image radio station 3b, and a file name to a network 2 that it should notify to image radio station 3b (step S606).

[0050] The file-sharing section 31 of each image radio station 3 will judge whether this signal is a thing addressed to a local station with reference to ID of the image radio station which the signal concerned includes inside, if the signal from a network 2 is received. Therefore, image radio station 3b judges it as the signal addressed to a local station, and performs the following processings. The file-sharing section 31 of image radio station 3b judges whether an interruption instruction is included in an input signal (drawing 5 ; step S501). Since this input signal includes ID and the file name of the terminal station 5 and image radio station 3b and an interruption instruction is not included so that clearly from ****, the file-sharing section 31 shifts to step S502. Next, the file-sharing section 31 opens the shared file corresponding to the file name included in an input signal, and outputs the image information included in this file, and ID of the terminal station 5 contained in the input signal, and image radio station 3b to the image information transmitting section 32. The image information transmitting section 32 will create an image information packet (refer to drawing 2 (a)), if image information etc. is inputted. In this image information packet, ID of image radio station 3b is stored in the image radio station ID section 2221. Since it is as having mentioned above about other parts 2222 and 2223, each explanation is omitted. The image information transmitting section 32 changes and carries out time-division multiplexing of this image information packet to a lightwave signal, uses the 1st radio channel for the terminal station 5, and transmits to it (step S502).

[0051] As mentioned above, the image information receive section 51 of the terminal station 5 changes the receiving lightwave signal from the 1st radio channel into an electrical signal, and outputs to a control section 54. A control section 54 inputs this electrical signal (drawing 4 ; step S401), and judges that this electrical signal is an image information packet. Next, a control section 54 detects ID of the method local station of terminal station ID section 2222 of this packet, by this, judges that the packet concerned is a thing addressed to a local station (step S402), and shifts to step S409. Next, a control section 54 displays on a display the image information stored in the image information bureau 2223 of an image information packet (step S409). By this, the user of the terminal office 5 can view and listen to the selected image information.

[0052] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. If the image information receive section 51 of the terminal station 5 breaks away in the above locations, it will become receive-not-ready ability about a lightwave signal. A control section 54 will shift to step S410, if the image information receive section 51 detects that it is receive-not-ready ability about an image information packet (step S401). Next, a control section 54 judges whether image information was displayed on the display based on the control state of a display (not shown) etc. (step S410). At present, since a control section 54 judges it as under a display, it shifts to step S411. Next, a control section 54 creates a command packet (refer to drawing 2 (c)). In this command packet, ID of image radio station 3b which should execute "an interruption instruction" (above-mentioned) stored in the command section 2231 is stored in the image radio station ID section 2230. Since it is as having mentioned above about other parts 2280, 2229, and 2231, each explanation is omitted. The control information transmitting section 53 sends out this command packet to the 2nd radio channel (step S411).

[0053] The control information receive section 43 of the control radio station 4 receives the signal from the 2nd radio channel, and outputs to a control section 41. A control section 41 analyzes the identification code section of the packet which is an input signal, it judges that this packet is not a title demand packet (drawing 6 ; step S601), and it is judged further that it is not an image demand packet (step S603). Next, a control section 41 shifts to step S607, and this packet judges whether it is a command packet (step S607). As mentioned above, based on the 2nd identification code, a control section 41 judges a receive packet to be a command packet, and shifts to S608. Next, a control section 41 takes out ID of the terminal station 5 stored in the command packet, and image radio station 3b, and "an interruption instruction", and outputs them to the control information transmitting section 42. The control information transmitting section 42 outputs the terminal station ID, the image radio station ID, and interruption instruction which were inputted to a network 2, and gives interruption advice of an image information packet to image radio station 3b (step S608).

[0054] The input signal from a network 2 judges the file-sharing section 31 of each image radio station 3 like the above-mentioned for whether it is a signal addressed to a local station. Therefore, image radio station 3b judges it as the signal addressed to a local station, and performs processing explained below. The file-sharing section 31 of image radio station 3b judges whether an interruption instruction is included in an input signal (drawing 5 ; step S501). Since the interruption instruction is included in this input signal so that clearly from ****, the file-sharing section 31 shifts to step S503. Next, the file-sharing section 31 performs interruption processing (step S503). That is, the file-sharing section 31 interrupts and closes read-out of the shared file for the terminal stations corresponding to ID of the terminal station contained in an input signal. In connection with this, the image information transmitting section 32 suspends creation of an image information packet.

[0055] Next, when not displaying the image on the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs the inside of image non-display in no 1st communication link zone 6, it seceded from the terminal station 5. If the image information receive section 51 of the terminal station 5 breaks away in the above locations, it will become receive-not-ready ability about a lightwave signal. If it judges that a control section

54 does not have an input signal from the image information receive section 51 (step S401), it will shift to step S410. Then, it judges whether image information displayed the control section 54 on the display (step S410). Since it judges that a control section 54 is not under display, it shifts to step S412, the display of the title current displayed on a display is terminated (step S412), and it stands by that the image information receive section 51 or the control information receive section 52 receives a transmission signal or a lightwave signal.

[0056] Next, the wireless image communication system concerning the 2nd operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 1st operation gestalt, only points equipped with the control radio station 7 where an internal configuration is different from the control radio station 4 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 1st operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 7 is the block diagram showing the configuration of the control radio station 7 mentioned above. In drawing 7, only the points which contain the communication channel information storing section 71 further differ as compared with the configuration of the control radio station 4 which shows the configuration of the control radio station 7 to drawing 1. Since it is the same about the other configuration, suppose that the same reference number is attached about a corresponding configuration. The communication channel information storing section 71 stores ***** in the operating condition of the communication channel for every image radio station 3. That is, each image radio station 3 has a number of communication channels defined beforehand, and transmits an image information packet to the terminal station 5 using either of this communication channel. the communication channel information storing section 71 is held in the initial state of this system as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has beforehand, respectively, and can set it. The number of empty communication channels is updated whenever a control section 41 inputs an image demand packet or a command packet ("interruption instruction") (it mentions later for details).

[0057] Drawing 8 is a flow chart which shows actuation of the control radio station 7 shown in drawing 7. In drawing 8, the actuation which the control radio station 7 performs differs as compared with actuation of the control radio station 4 shown in drawing 6 at the point which contains further steps S801, S802, S803, and S804. Since it is the same about the other actuation, the same step number is given to a corresponding step, and the explanation is simplified.

[0058] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like the 1st operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0059] If the terminal office 5 advances into 1st communication link zone 6b, the title of image information will be first required of the control radio station 7 (drawing 4; steps S401-S406). Answering this demand, the control radio station 7 transmits the title of image information to the terminal office 5 using the 2nd radio channel (drawing 8; steps S601 and S602). The terminal office 5 displays on a display the title of the image information sent from the control radio station 7 (drawing 4; steps S401-S404, S406). Then, the terminal office 5 transmits an image demand packet that the image information according to a user's hope should be required of image radio station 3b (drawing 4; steps S401-S403 and S408). The control section 41 of the control radio station 7 performs actuation of steps S601 and S603, judges an input signal to be an image demand packet, and shifts to step S604. Next, a control section 41 takes out and holds ID of the terminal station stored in the terminal station ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information (step S604). Next, a control section 41 searches the communication channel information storing section 71, and detects the number of

empty channels of image radio station 3b specified by ID of the image radio station taken out at step S604. A control section 41 judges [which detected] whether it is vacant and image radio station 3b has the current opening channel based on the number of channels (step S801). That is, a control section 41 judges that image radio station 3b can meet the image demand from the terminal office 5, if the detected number of empty channels does not show "0." Next, a control section 41 updates the number of empty channels of image radio station 3b in which the communication channel information storing section 71 is carrying out current storing to "-(it detected the number of channels) 1" (step S802). Next, a control section 41 performs processing of steps S605 and S606, and outputs ID of a terminal station, ID of image radio station 3b, and a file name to a network 12 (step S606).

[0060] Only image radio station 3b receives the signal from a network 2. Image radio station 3b performs actuation of steps S501 and S502 shown in drawing 5, and after it changed the created image information packet into the lightwave signal and it carries out Time Division Multiplexing based on the advice from the control radio station 7, it sends it out to the 1st radio channel. If the lightwave signal from the 1st radio channel is received, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 4, and will display image information on a display.

[0061] As mentioned above, the control radio station 7 checks the operating condition of the communication channel of the image radio station 3 which corresponds whenever a Request-to-Send packet receives. At this time, the number of the terminal stations 5 located in 1st communication link zone 6b which image radio station 3b has increases, and suppose that the terminal station 5 of these large number sent out the Request-to-Send packet to the control radio station 7 almost simultaneous. In this case, the control radio station 7 will repeat and perform processing of steps S601, S603, S604, S801, S802, S805, and S606 shown in drawing 8, and the number of empty channels of image radio station 3b which the communication channel information storing section 71 holds becomes small, and is soon set to "0." A control section 41 judges whether image radio station 3b has a current opening channel in step S801. If the detected number of empty channels shows "0" at this time, image radio station 3b will judge that a control section 41 cannot respond the image demand from the terminal office 5, and it will shift to step S803. Next, a control section 41 creates the control information containing this purport and ID of the terminal office concerned in order to notify the purport which cannot receive the Request-to-Send packet of the terminal office 5 concerned to the terminal office 5 which has ID of the terminal office held by actuation of step S604 now. This control information is sent out to the 2nd radio channel from the control information transmitting section 142 (step S803). The terminal office 5 which received this control information displays the purport which cannot receive a Request-to-Send packet on a display (not shown), and notifies a user of this purport. In addition, since processing of the terminal station 5 at this time can be performed simply, that explanation is omitted.

[0062] On the other hand, an image information packet is received now, if the terminal office 5 which is among graphic display comes out of 1st communication link zone 6b, actuation of steps S401, S410, and S411 shown in drawing 4 will be performed, and a command packet (refer to drawing 2 (c)) will be transmitted to the control radio station 7 through the 2nd radio channel. The control radio station 7 which received this command packet performs processing of steps S601, S603, S607, and S608 shown in drawing 8, and notifies it that sending out of an image information packet is interrupted to image radio station 3b. By this, image radio station 3b stops sending out of the image information packet corresponding to this advice, and releases the communication channel used since the image information packet concerned was sent out. A control section 41 performs actuation after [S804] step S608, and takes out ID of image radio station 3b from the image radio station ID section 2230 of a command packet. Next, a control section 41 detects the number of empty channels of image radio station 3b specified by ID of the image radio station which searched and took out the communication channel information storing section 71, and updates the number of empty channels to "+(it detected the number of channels) 1" (step S804).

[0063] Next, the wireless image communication system concerning the 3rd operation gestalt of

this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 2nd operation gestalt, a point equipped with the control radio station 9 where the control radio station 7 differs from an internal configuration differs from the point that the control radio station 9 transmits not "the title of image information" but "menu information." Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 2nd operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified.

[0064] Drawing 9 is the block diagram showing the configuration of the control radio station 9 mentioned above. In drawing 9, only the points which contain the menu storing section 91 further as compared with the configuration of the control radio station 7 which shows the configuration of the control radio station 9 to drawing 7 differ. Since it is the same about the other configuration, suppose that the same reference number is attached about a corresponding configuration. A video server 1 classifies and stores the title of the image information stored in a network 2 for every thing which can transmit each image radio station 3, and the menu storing section 91 stores further the identification number set up corresponding to object ****.

[0065] Drawing 10 is drawing showing the configuration of the frame format of the menu information packet transmitted from the control radio station 9 shown in drawing 9. A menu information packet contains the terminal station ID section 2236, the number section 2237 of transmitting menus, the menu text section 2238, the menu identification number section 2239, and the image radio station ID section 2240. ID of the terminal station 5 which required the menu information packet is stored in the terminal station ID section 2236. The number of the menu text sections 2238 stored in a menu information packet is stored in the number section 2237 of transmitting menus. The title of image information which can transmit each image radio station 3 is stored in the menu text section 2238. The identification number for specifying the title of each image information stored in the menu text section 2238 is stored in the menu identification number section 2239. ID of the image radio station 3 which can transmit the image information concerning the above-mentioned title is stored in the image radio station ID section 2240.

[0066] Drawing 11 is a flow chart which shows actuation of the terminal office 5 concerning this operation gestalt. In drawing 11, the actuation which the terminal office 5 performs differs at the point which contains step S1101–1105 further as compared with actuation of the terminal office 5 shown in drawing 4. About the other actuation, since it is the same as that of the actuation shown in drawing 4, the same step number is given to a corresponding step, and the explanation is simplified. Drawing 12 is a flow chart which shows actuation of the control radio station 9 shown in drawing 9. In drawing 12, actuation of the control radio station 9 differs at the point which contains steps S1201–S1204 further as compared with actuation of the control radio station 7 shown in drawing 8. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified.

[0067] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0068] If the terminal station 5 advances into 1st communication link zone 6b, it will receive the lightwave signal from image radio station 3b, and will change it into an electrical signal. A control section 54 inputs this electrical signal (drawing 11; step S401), and the electrical signal concerned judges whether it is an image information packet addressed to a local station (step S402). Since ID of other terminal stations is stored in the image information packet, a control section 54 shifts to step S1101. Next, a control section 54 judges whether the menu (the content of the menu test section of a menu information packet) is displayed on the display based on the control state of a display (not shown) etc. (step S1101). At present, since the menu is not displayed on a display, a control section 54 shifts to step S1102. Next, a control section 54 judges whether the menu was already required with reference to the flag (the same

thing as the "flag" in the 1st operation gestalt) stored in internal memory (not shown) (step S1202). Since it shows that the flag is not demanding the menu now, a control section 54 shifts to step S405, and takes out ID of image radio station 3b out of an image information packet (step S405). Then, a control section 54 creates a menu demand packet (it has the same frame format as drawing 2 (d)). In addition, since the identification code stored in each part of a menu demand packet and ID are the same as that of what is stored in a title demand packet in the 1st operation gestalt, the explanation is omitted. However, "a menu demand" is stored in the title demand section 2235. Then, a control section 54 is set up so that having required the menu for the above-mentioned flag may be shown. A menu demand packet is sent to the control radio station 9 through the 2nd radio channel from the control information transmitting section 53. Thus, the terminal station 5 requires a menu from the control radio station 9 (step S1103).

[0069] The control information receive section 43 of the control radio station 9 receives the signal from the 2nd radio channel, and outputs to a control section 41. A control section 41 will search whether menu information is stored in the menu information storing section 91, if this signal is inputted (drawing 12 ; step S1201). A control section 41 judges whether it is a title demand packet by shifting to step S1203 and analyzing the identification code section of the packet which is an input signal, when the menu information storing section 91 judges that menu information is stored (step S1203). Since the 3rd identification code is stored in the identification code section of this packet, a control section 41 judges that it is a menu demand packet, and shifts to step S1204. Next, a control section 41 takes out ID of the terminal station 5, and ID of image radio station 3b from the terminal station ID section 2233 of a menu demand packet, and the image radio station ID section 2234. A control section 41 creates ejection and a menu information packet for the identification number for specifying the title of image information and this which image radio station 3b can transmit out of the menu information storing section 91. In this menu information packet, ID of the terminal station 5 which is demanding current menu information is stored in the terminal station ID section 2236. The number of the menu text sections 2238 is stored in the number section 2237 of transmitting menus. That is, since the number of the menu text sections by which current creation is carried out is one, "1" is stored in the number section 2237 of transmitting menus. The title of image information which can receive within 1st communication link zone 6b, i.e., a menu, is stored in the menu text section 2238. The identification number for specifying the title of each image information is stored in the menu identification number section 2239. ID of image radio station 3b is stored in the image radio station ID section 2240. Thus, the created menu information packet is transmitted to the terminal station 5 by the control information transmitting section 42 through the 2nd radio channel (step S1204).

[0070] If the signal which the control information receive section 52 received is inputted (drawing 11 ; step S401), the control section 54 of the terminal office 5 will perform actuation of step S402 (refer to the 1st operation gestalt), will judge that an input signal is not an image information packet, and will shift to step S1101. A control section 54 performs actuation of steps S1101 and S1102 which is the same actuation as steps S403 and S404 mentioned above. That is, a control section 54 judges that the current menu is not displayed (step S1101), judges that menu information was already required (step S1102), and shifts to step S1104. By this, a control section 54 judges an input signal to be a menu information packet, and the menu contained in this packet is displayed on a display (step S1104). The user of the terminal station 5 operates an alter operation machine (not shown), and chooses the title of image information to view and listen out of the title of the image information displayed on the display. An alter operation machine outputs the signal which answers actuation of a user and shows the title of the selected image information to a control section 54. A control section 54 inputs the signal from an alter operation machine (step S401). It shifts to step S408 in order to judge that the current title is displayed (step S403), after a control section 54 judges this input signal not to be an image information packet (step S402), so that more clearly than the above-mentioned. By this, a control section 54 judges that an input signal is a signal which shows the title of image information, creates an image demand packet (refer to drawing 2 (b)), and transmits (step S408). In this image demand packet, ID of image radio station 3b is stored in the image radio station ID

section 2226, and the identification number corresponding to the title of the image information chosen by the user is stored in the demand image section 2227. About other parts 2224 and 2225, since it is as having mentioned above, those explanation is omitted. This image demand packet is sent to the control radio station 9 through the 2nd radio channel from the control information transmitting section 53.

[0071] The control information receive section 43 of the control radio station 9 receives a packet from the 2nd radio channel, and outputs to a control section 41. After a control section 41 checks that menu information is stored in the menu information storing section 91 (drawing 12 ; step S1201), this packet judges it not to be a menu demand packet (step S1203). Next, a control section 41 judges whether the inputted packet is an image demand packet (step S603). Since the 1st identification code is stored in the identification code section of this packet, a control section 41 judges the packet concerned to be an image demand packet. Next, a control section 41 takes out the identification number for specifying ID of the terminal station stored in the terminal station ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information (step S604). Next, only when a control section 41 performs actuation of steps S801 and S802 explained in full detail in the 2nd operation gestalt, image radio station 3b is vacant as for it and it has the channel, the file name corresponding to the identification number taken out by processing of step S604 is taken out out of the file name (title of image information) of the shared file managed in the new information storing section 91 (step S605). Next, a control section 41 outputs ID of the terminal station taken out by processing of step S604, and image radio station 3b, and the file name taken out by processing of step S605 to the control information transmitting section 42. The control information transmitting section 42 outputs ID and the file name of terminal station and image radio station 3b to a network 2 (step S606).

[0072] If the signal from a network 2 is received, image radio station 3b will perform actuation of steps S501 and S502 shown in drawing 5 the same with having explained in full detail in the 1st operation gestalt, and will create an image information packet (refer to drawing 2 (a)). The image information transmitting section 32 changes and carries out time-division multiplexing of this image information packet to a lightwave signal, uses the 1st radio channel for the terminal station 5, and transmits to it. If the lightwave signal from the 1st radio channel is received as mentioned above, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 1 the same with having explained in full detail in the 1st operation gestalt, and will display image information on a display. By this, the user of the terminal office 5 can view and listen to the selected image information.

[0073] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. In this case, the same with having explained in full detail in the 1st operation gestalt, the terminal office 5 performs actuation of steps S401, S410, and S411, and creates a command packet (refer to drawing 2 (c)). The control information transmitting section 53 sends out this command packet to the 2nd radio channel.

[0074] The control information receive section 43 of the control radio station 9 receives a packet from the 2nd radio channel, and outputs to a control section 41. It is judged that a control section 41 is not a menu demand packet and an image demand packet since the 2nd identification code is stored in this packet after checking that menu information is stored in the menu information storing section 91 (drawing 12 ; step S1201) (steps S1203 and S603). Next, a control section 41 shifts to step S607, and this packet judges that it is a command packet. Next, the same with having explained in full detail in the 2nd operation gestalt, a control section 41 performs actuation of steps S608 and S804, and gives interruption advice of an image information packet to image radio station 3b. The same with having explained in full detail in the 1st operation gestalt, processing of steps S501 and S503 is performed, the advice of interruption from the control radio station 9 answers, and image radio station 3b interrupts and closes read-out of the shared file turned terminal station 5. In connection with this, the image information transmitting section 32 suspends creation of an image information packet.

[0075] Next, when not displaying the image on the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs the inside of image non-display in no 1st communication link zone 6, it seceded from the terminal station 5. In this case, the terminal station 5 judges a lightwave signal that there is no input signal by becoming receive-not-ready ability (step S401), and shifts to step S410. Then, in order that image information may not display a control section 54 on a display, the display of the menu current displayed on a display is terminated (step S1105).

[0076] Next, the wireless image communication system concerning the 4th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 3rd operation gestalt, only points equipped with the control radio station 13 where an internal configuration is different from the control radio station 9 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 3rd operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 13 is the block diagram showing the configuration of the control radio station 13 mentioned above. In drawing 13, only the points which contain the positional information storing section 131 further differ as compared with the control radio station 9 which shows the control radio station 13 to drawing 9. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The positional information storing section 131 stores the information about the current position of the terminal station 5 concerned using ID of the terminal station 5 sent with a menu demand.

[0077] Drawing 14 is a flow chart which shows actuation of the terminal office 5 concerning this operation gestalt. In drawing 14, the actuation which the terminal office 5 performs differs at the point which contains step S1401 further as compared with actuation of the terminal office 5 shown in drawing 11. About the other actuation, since it is the same as that of the actuation shown in drawing 11, the same step number is given to a corresponding step, and the explanation is simplified. Drawing 15 is a flow chart which shows actuation of the control radio station 13 shown in drawing 13. In drawing 15, actuation of the control radio station 13 differs at the point which contains steps S1501 and S1502 further as compared with actuation of the control radio station 9 shown in drawing 12. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified.

[0078] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0079] If the terminal office 5 advances into 1st communication link zone 6b, menu information will be first required of the control radio station 1501 (drawing 14 ; steps S401, S402, S1101, S1102, S405, and S1103). Answering this demand, the control radio station 13 transmits the menu information packet created based on menu information to the terminal office 5 using the 2nd radio channel (drawing 15 ; steps S1201, S1203, and S1204). In addition, when menu information is not stored in the menu information storing section 91, the control radio station 13 transmits a menu information packet, after creating menu information (step S1202). Next, a control section 41 stores in the positional information storing section 131 ID of the terminal station 5 sent with a demand of menu information, and image radio station 13b (step S1501). By this, the control radio station 13 recognizes that the 1st communication link zone 6 in which the terminal station 5 is carrying out the current position is a zone which image radio station 3b has.

[0080] The terminal office 5 displays menu information on a display based on the menu information packet sent from the control radio station 13 (drawing 14 ; S401, S402, S1101, S1102, and S1104). Then, the terminal office 5 transmits the image demand packet to image radio-station 13b Turn to the control radio station 13 through the 2nd radio channel (drawing 14 ; steps S401, S402, S1101, and S408). By performing actuation of steps S1201, S1203, S603,

and S604 shown in drawing 15, the control section 41 of the control radio station 13 judges the input signal from the 2nd radio channel to be an image demand packet, and takes out and holds further ID of the terminal office stored in the terminal office ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information. Next, a control section 41 detects the number of empty channels of image radio station 3b specified by ID of the image radio station taken out at step S604. A control section 41 updates the detected number of empty channels of image radio station 3b in which the communication channel information storing section 71 will carry out current storing like the 2nd operation gestalt if it is vacant and judges that image radio station 3b has the current opening channel based on the number of channels (step S801) (step S802). Next, a control section 41 performs processing of steps S605 and S606, and outputs ID of a terminal station, ID of image radio station 3b, and a file name to a network 2. In addition, in actuation of step S801, the control section 41 of performing [which detected] actuation of step S803 is the same as that of the 2nd operation gestalt, if it is vacant and the number of channels shows "0."

[0081] As mentioned above, only image radio station 3b receives the signal from a network 2. Image radio station 3b performs processing of steps S501 and S502 shown in drawing 5, and after it changed the created image information packet 2 into the lightwave signal and it carries out Time Division Multiplexing based on the advice from the control radio station 13, it sends it out to the 1st radio channel. If a lightwave signal is received from the 1st radio channel, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 14, and will display image information on a display.

[0082] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. If it comes out to the above locations, the terminal office 5 will perform actuation of step S401 shown in drawing 14, and steps S410 and S411 like the above-mentioned, and will transmit a command packet to the control radio station 13 using the 2nd radio channel. The control radio station 13 updates communication channel information while it performs steps S1201, S1203, S603, S607, S608, and S804 shown in drawing 15 and sends advice of interruption to image radio station 3b. Then, with reference to ID of the terminal station stored in the terminal station ID section 2229 of a command packet, deletion etc. carries out ID of image radio station 3b stored in the positional information storing section 131 at the time of actuation of step S1501, and a control section 41 updates positional information (step S1502). A control section 41 can recognize the terminal office 5 seceding from 1st communication link zone 6b, and being located in neither of the 1st communication link zone 6 by this, now.

[0083] Next, when not displaying the image on the location which is in the 2nd communication link zone 7 from 1st communication link zone 6b, and belongs the inside of image non-display in no 1st communication link zone 6, it seceded from the terminal station 5. If it comes out to the above locations, the terminal office 5 will perform actuation of steps S401, S410, and S1105 shown in drawing 14, and will eliminate the menu information displayed on a display. Then, the control section 54 of the terminal office 5 creates the command packet shown in drawing 2 (c), and transmits to the control radio station 13 using the 2nd radio channel. However, the purport which updates not "an interruption instruction" mentioned above but the positional information stored in the positional information storing section 131 is stored in the command section 2231 of this command packet. By performing the same actuation as step S1702 mentioned above, deletion etc. carries out ID of image radio station 3b stored in the positional information storing section 131 at the time of actuation of step S1501, and the control radio station 13 updates positional information.

[0084] Next, the wireless image communication system concerning the 5th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 4th operation gestalt, only points equipped with the control radio station 16 where an internal configuration is different from the control radio station 13 differ. Therefore, the graphic display of the whole configuration of this

system is omitted, the still more nearly same reference number as the part which corresponds in the 4th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 16 is the block diagram showing the configuration of the control radio station 16 mentioned above. In drawing 16, only the points which contain the location hysteresis information storing section 161 further differ as compared with the control radio station 16 which shows the control radio station 16 to drawing 13. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The location hysteresis information storing section 161 stores the hysteresis of the information about a path until the terminal station 5 results in current, i.e., location hysteresis information, using the information stored in the positional information storing section 131.

[0085] Drawing 17 is a flow chart which shows actuation of the control radio station 16 shown in drawing 16. In drawing 17, actuation of the control radio station 16 differs as compared with actuation of the control radio station 16 shown in drawing 17 the point which contains step S1701 further, and in that actuation of step S1502 shown in drawing 17 is not performed. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified. In addition, the image radio station 3 and the terminal office 5 concerning this operation gestalt perform actuation shown in drawing 5 and drawing 14. Therefore, actuation of the image radio station 3 and the terminal office 5 is simplified and explained with reference to drawing 11 and drawing 14.

[0086] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it.

[0087] If the terminal office 5 advances into 1st communication link zone 6b, menu information will be first required of the control radio station 1501 (drawing 14 ; steps S401, S402, S1101, S1102, S405, and S1103).

[0088] Answering this demand, the control radio station 16 transmits the menu information packet created based on menu information to the terminal office 5 using the 2nd radio channel (drawing 17 ; steps S1201, S1203, and S1204). In addition, when menu information is not stored in the menu information storing section 91, the control radio station 16 transmits a menu information packet, after creating menu information (step S1202). Next, a control section 41 stores the ID concerned as 1st communication link zone 6 located in the field to which ID of the image radio station 3 by which current storing is carried out is stored in the location hysteresis information on the terminal station 5 concerned by the positional information storing section 131 in ejection and the location hysteresis information storing section 161 last time (step S1701). Next, a control section 41 stores in the positional information storing section 131 ID of the terminal station 5 sent with a demand of menu information, and image radio station 13b (step S1501).

[0089] The terminal office 5 displays a menu on a display based on the menu information packet sent from the control radio station 16 (drawing 14 ; S401, S402, S1101, S1102, and S1104). Then, the terminal office 5 transmits the image demand packet to image radio-station 13b Turn to the control radio station 16 through the 2nd radio channel (drawing 14 ; steps S401, S402, S1101, and S408). By performing actuation of steps S1201, S1203, S603, and S604 shown in drawing 17, the control section 41 of the control radio station 16 judges the input signal from the 2nd radio channel to be an image demand packet, and takes out and holds further ID of the terminal office stored in the terminal office ID section 2225, the image radio station ID section 2226, and the demand image section 2227 of an image demand packet, ID of image radio station 3b, and the title of image information. Next, only when image radio station 3b is vacant and it has the channel by performing actuation of steps S801 and S802, a control section 41 performs actuation of steps S605 and S606, and outputs ID of a terminal station, ID of image radio station 3b, and a file name to a network 2. In addition, in actuation of step S801, the control section 41 of performing [which detected] actuation of step S803 is the same as that of the 2nd operation

gestalt, if it is vacant and the number of channels shows "0."

[0090] As mentioned above, only image radio station 3b receives the signal from a network 2. Image radio station 3b performs processing of steps S501 and S502 shown in drawing 5, and after it changed the created image information packet 2 into the lightwave signal and it carries out Time Division Multiplexing based on the advice from the control radio station 16, it sends it out to the 1st radio channel. If a lightwave signal is received from the 1st radio channel, the terminal office 5 will perform actuation of steps S401, S402, and S409 shown in drawing 14, and will display image information on a display.

[0091] Then, it seceded from the terminal station 5 to the location which is in the 2nd communication link zone 7, and belongs from 1st communication link zone 6b in graphic display in no 1st communication link zone 6. If it comes out to the above locations, the terminal office 5 will perform actuation of step S401 shown in drawing 14, and steps S410 and S411 like the above-mentioned, and will transmit a command packet to the control radio station 16 using the 2nd radio channel. The control radio station 16 updates communication channel information while it performs steps S1201, S1203, S603, S607, S608, and S804 shown in drawing 17 and sends advice of interruption to image radio station 3b. In addition, since the control radio station 16 enables it to store ID of the image radio station 3 in the location hysteresis information storing section 161 in actuation of next step S1701, it does not perform the same actuation as step S1502 (refer to drawing 15) like the 4th operation gestalt, but stores ID of image radio station 3b in the positional information storing section 131 as it is.

[0092] Next, the inside of image non-display, the terminal station 5 was in the 2nd communication link zone 7 from 1st communication link zone 6b, and when not displaying the image on the location belonging to no 1st communication link zone 6, it came out. If it comes out to the above locations, the terminal office 5 will perform actuation of steps S401, S410, and S1105 shown in drawing 14, and will eliminate the menu information displayed on a display. Then, the control section 54 of the terminal office 5 creates the command packet shown in drawing 2 (c), and transmits to the control radio station 16 using the 2nd radio channel. However, the purport which updates not "an interruption instruction" mentioned above but the positional information stored in the positional information storing section 131 is stored in the command section 2231 of this command packet. In addition, since it enables it to store ID of the image radio station 3 in the location hysteresis information storing section 161 in actuation of next step S1701, the control radio station 16 does not perform the same actuation as step S1502 (refer to drawing 15) like the 4th operation gestalt.

[0093] Next, the wireless image communication system concerning the 6th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 5th operation gestalt, only points equipped with the control radio station 18 where an internal configuration is different from the control radio station 16 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 5th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 18 is the block diagram showing the configuration of the control radio station 18 mentioned above. In drawing 18, only the points which contain the zone map storing section 181 further differ as compared with the control radio station 16 which shows the control radio station 18 to drawing 16. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. the zone map storing section 181 — every — the 1st communication link zone 6 and the 1st communication link zone 6 which is alike, respectively and adjoins are managed using the image radio station ID of the image radio station 3.

[0094] Drawing 19 is a flow chart which shows actuation of the control radio station 18 shown in drawing 18. In drawing 19, actuation of the control radio station 18 differs at the point which contains step S1901 further as compared with actuation of the control radio station 16 shown in drawing 17. Drawing 20 is a flow chart which shows actuation of the terminal office 5 concerning this operation gestalt. In drawing 20, the terminal offices 5 differ as compared with actuation of the terminal office 5 shown in drawing 14 the point of performing actuation of steps S2001 and

S2002 further, and in that actuation of step S405 is not performed. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified. In addition, the image radio station 3 concerning this operation gestalt is simplified and explained about the actuation, in order to perform actuation shown in drawing 5.

[0095] Hereafter, the actuation of this system at the time of following the moving trucking which the terminal office 5 shows to drawing 3 is explained like an old operation gestalt. first, in the initial state of this system, the communication channel information storing section 71 is held as the number of the empty communication channels which boil the number of the communication channels which each image radio station 3 has, respectively, and can set it. Moreover, the terminal station 5 stores in internal memory (not shown) the menu information packet sent last time from the control radio station 18.

[0096] If the terminal station 5 advances into 1st communication link zone 6b, it will judge whether the menu is displayed on the display (steps S401, S402, and S1101). The control section 54 of the terminal station 5 shifts to step S2001 in order to judge at present that the menu is not displayed. A control section 54 detects whether there is ID of image radio station 3b which takes out from the image information packet concerned and is held, when the image information packet for other terminal stations is received in step S401 in the image radio station ID section 2240 of the menu information packet currently held inside current. It is judged that the control section 54 will hold the menu required now if ID of image radio station 3b is detected in the menu information packet currently held in memory (step S2001). In this case, a control section 54 displays a menu required now on ejection out of the menu information packet currently held in memory, and displays this on a display (step S1104). By this, the terminal office 5 can transmit an image demand packet.

[0097] On the other hand, when it is judged that the control section 54 does not hold the menu required now in step S2001, actuation of steps S1102 and S1103 is performed, and a menu is required from the control radio station 18. Answering this demand, the control radio station 16 transmits the menu information packet created based on menu information to the terminal office 5 using the 2nd radio channel (drawing 15 ; steps S1201, S1203, S1901, and S1204). The control radio station 16 creates the menu information on the image radio station 3 which has the communication link zone which adjoins image radio station 3b and 1st communication link zone 6b, creates a menu information packet and transmits it based on this with reference to ID of image radio station 3b sent with a demand of menu information out of the menu information stored in the zone map storing section 181 at this time (step S1901). Therefore, although this menu information packet has the format shown in drawing 10, only a part with the image radio station 3 which has the communication link zone where the menu text section 2238, the menu identification number section 2239, and the image radio station ID section 2240 adjoin image radio station 3b and 1st communication link zone 6b exists. Therefore, the number of these image radio stations 3 is stored in the number section 2237 of transmitting menus. Then, the control section 41 (a having explained in full detail in the 5th operation gestalt passage performs actuation of steps S1701 and S1501.),

[0098] The terminal office 5 displays menu information on a display based on the menu information packet sent from the control radio station 16 (drawing 20 ; S401, S402, S1101, S2001, and S1104). By this, the terminal office 5 can transmit an image demand packet. Furthermore, the control section 54 stores in internal memory the menu information packet transmitted from the control radio station 16.

[0099] Next, the wireless image communication system concerning the 7th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 6th operation gestalt, only points equipped with the control radio station 21 where an internal configuration is different from the control radio station 18 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 6th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 21 is the block diagram showing the configuration of the control radio station 21 mentioned

above. In drawing 21, only the points which contain the image hysteresis information storing section 211 further differ as compared with the control radio station 18 which shows the control radio station 21 to drawing 18. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The image hysteresis information storing section 211 divides and stores the image information which each terminal office 5 received from the image radio station 3 for every terminal office.

[0100] Drawing 22 is a flow chart which shows actuation of the control radio station 21 shown in drawing 21. In drawing 22, actuation of the control radio station 21 differs at the point which contains step S2201 further as compared with actuation of the control radio station 18 shown in drawing 19. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is omitted. In addition, the image radio station 3 and the terminal office 5 concerning this operation gestalt simplify the explanation about actuation, respectively, in order to perform actuation shown in drawing 5 and drawing 20.

[0101] If the image demand packet from the terminal office 5 is received, the control radio station 21 will perform actuation of steps S1201, S1203, S603, S604, S801, S802, and S605 shown in drawing 22 like the 6th operation gestalt etc., in order that it may notify the terminal office ID and a file name to image radio station 3b. Then, the control section 41 of the control radio station 21 stores a title in the field to which the title of the image information stored in the demand image section 2227 of an image demand packet is stored in the image hysteresis information on this terminal station 5 in ejection and the image hysteresis information storing section 211 for the taken-out image information (step S2201). Then, a control section 41 performs actuation of step S606, and notifies the terminal station ID and a file name to image radio station 3b.

[0102] Next, the wireless image communication system concerning the 8th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 7th operation gestalt, only points equipped with the image radio station 23 where an internal configuration is different from the image radio station 3 differ. Therefore, the graphic display of the whole configuration of this system is omitted, the still more nearly same reference number as the part which corresponds in the 7th operation gestalt about the configuration of those other than this point of difference is attached, and the explanation of those other than this point of difference is simplified. Drawing 23 is the block diagram showing the configuration of the image radio station 23 mentioned above. In drawing 23, only the points which contain the image cache section 231 further differ as compared with the control radio station 3 which shows the image radio station 23 to drawing 1. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The image cache section 231 consists of the storage elements or recording devices in which rapid access is possible, and stores a part of shared file which is image information.

[0103] Drawing 24 is a flow chart which shows actuation of the image radio station 23 shown in drawing 23. As compared with actuation of the image radio station 3 which showed actuation of the image radio station 23 to drawing 5 in drawing 24, it is the point (it differs in that actuation of step S502 is not performed.) of performing steps S2401-S2411 further. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is omitted. Moreover, the control radio station 21 and the terminal office 5 concerning this operation gestalt perform actuation shown in drawing 21 and drawing 14. Therefore, it omits about actuation of the image radio station 21 and the terminal station 5.

[0104] If the image radio station 23 receives ID and the file name of the terminal station notified from the control radio station 21, and an image radio station through a network 2, this will judge whether it is advice addressed to a local station like an old operation gestalt. Suppose that it was judged like the old operation gestalt that image radio station 223b was advice addressed to a local station at this time. Image radio station 223b performs first actuation of step S501 shown in drawing 24, judges that this advice is not interruption directions, and shifts to step S2401. Next, the file-sharing section 31 opens the shared file corresponding to the file name included in an input signal (advice from the control radio station 21) (step S2401). ** is judged [whether the

image cache section 231 has whether the file corresponding to the file name included in an input signal is stored in the interior, and the directed image information that is, in the image cache section 231, and] in order that this opening may require some time amount next (step S2402). If it judges that the image cache section 231 does not store the file concerning the interior at this time, it will shift to step S2403. That is, after the shared file section 31 reads a shared file (step S2403), this is outputted to the image information transmitting section 32. The image information transmitting section 32 creates an image information packet like an old operation gestalt, and transmits to the terminal station 5 (step S2404). Moreover, a part of shared file in which reading appearance was carried out by the shared file section 31 is stored in the image cache section 231 a sake [when transmission of the same file is directed next time].

[0105] Thus, when the file is stored in the image cache section 231 (i.e., when it is judged that the directed image information is in the image cache section 231 in actuation of step S2401), image radio station 23b shifts to step S2405. After opening and (step S2405) reading the file which image radio station 23b was stored in the image cache section 231, and was directed at this time (step S2406), this file is outputted to the image information transmitting section 32. Based on the inputted file, the image information transmitting section 32 creates an image information packet, and transmits to the terminal station 5 (step S2407). Then, image radio station 23b judges a shared file for whether read-out became possible from the file-sharing section 31 (step S2408). If image radio station 23b judges that this read-out cannot be performed, when it will repeat and perform actuation of steps S2406-S2407 and the read-out concerned of it will become possible, it interrupts read-out from the image cache section 231, and shifts to step S2403.

[0106] Next, the wireless image communication system concerning the 9th operation gestalt of this invention is explained. As compared with the wireless image communication system which this wireless image communication system requires for the 8th operation gestalt, only points equipped with the image radio station 25 where an internal configuration is different from the image radio station 23 differ. Therefore, the graphic display of the whole configuration of this system is omitted. Moreover, except this point of difference, the reference number same about the configuration explained in the 8th operation gestalt and the configuration which corresponds since it is the same is attached, and the explanation of those other than this point of difference is omitted. Drawing 25 is the block diagram showing the configuration of the image radio station 25 mentioned above. In drawing 25, only the points which contain the proper image information storing section 251 further differ as compared with the control radio station 23 which shows the image radio station 25 to drawing 23. Except it, since it is the same, suppose that the same reference number is attached about a corresponding configuration. The proper image information storing section 251 consists of a storage element or a recording apparatus, and stores the image information on the proper which has relation only in the image radio station 3 which contains the proper image information storing section 251 concerned among all the image information stored in the image information storing section 11 of a video server 1.

[0107] Drawing 26 is a flow chart which shows actuation of the image radio station 25 shown in drawing 25. In drawing 26, actuation of the image radio station 25 differs at the point which contains steps S2601-S26 further as compared with actuation of the image radio station 23 shown in drawing 24. Since it is the same about the other step, the same step number is given to a corresponding step, and the explanation is simplified. In addition, the control radio station 21 and the terminal office 5 concerning this operation gestalt perform actuation shown in drawing 21 and drawing 14. Therefore, explanation of actuation of the image radio station 21 and the terminal station 5 is omitted.

[0108] If the image radio station 25 receives ID and the file name of the terminal station notified from the control radio station 21, and an image radio station through a network 2, this will judge whether it is advice addressed to a local station like an old operation gestalt. Suppose that it was judged like the old operation gestalt that image radio station 25b was advice addressed to a local station at this time. Image radio station 25b performs first actuation of step S501 shown in drawing 24, judges that this advice is not interruption directions, and shifts to step S2601. Next, image radio station 3b judges whether the image information corresponding to the file name

included in an input signal (advice from the control radio station 21) is stored in the proper information storing section 251 (step S2601). If it judges that the proper information storing section 251 does not store the file concerning the interior at this time, as it explained in the 8th operation gestalt, an image information packet will be created and it will transmit (steps S2403 and S2404, steps S2405-S2408). When the shared file reading appearance was carried out [the shared file] by the shared file section 31 is the image information on a proper at this time, it is stored in the proper information storing section 251 a sake [when transmission of the same file is directed next time].

[0109] Thus, when the image information on a proper is stored in the proper image information storing section 251 (i.e., when it is judged that the directed image information is in the proper information storing section 2601 in actuation of step S2601), image radio station 25b shifts to step S2602. After opening and (step S2602) reading the file which image radio station 25b was stored in the proper image information storing section 251, and was directed at this time (step S2603), this file is outputted to the image information transmitting section 32. Based on the inputted file, the image information transmitting section 32 creates an image information packet, and transmits to the terminal station 5 (step S2604).

[Translation done.]

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- 2.**** shows the word which can not be translated.
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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]

[0009] In the conventional wireless image communication system, each wireless LAN base station 275 performs transceiver processing of control information and image information. Since image information and control information are transmitted using the same channel, each wireless LAN base station 275 cannot perform simultaneously transceiver processing of image information, and transceiver processing of control information. Therefore, each wireless LAN base station 275 must perform processing which interrupts transceiver processing of the image information concerned and transmits the received control information to the image information junction section 273, if control information is transmitted to the midst which is performing transceiver processing of image information from the wireless image terminal 277. Now, the transmission speed of image information fell and there was a trouble that the way piece of a receiving image arose in the wireless image terminal 277. Especially, many wireless image terminals 277 are located in the same communication link zone 276, and this trouble will become serious, when control information is transmitted all at once from two or more wireless image terminals 277.

[0010] Moreover, in the conventional wireless image communication system, if the image information which the video server 271 stores in the interior is updated, menu information must also be updated by the new thing. Therefore, if image information is updated during this wireless image communication system employment, a video server 271 must interrupt transmitting processing of image information, and must reconfigure menu information. Therefore, when a video server 271 sent out image information, there was a trouble that the throughput fell.

[0011] Moreover, in the conventional wireless image communication system, when two or more video servers 271 are connected to a network 272, it is necessary to include the information which shows in which video server 271 the image information specified by the title else [, such as a title of image information,] is stored in menu information. Therefore, the amount of data of the control information transmitted to the wireless image terminal 277 increases from each wireless LAN base station 275. The increment in this amount of data originated, the transmission speed of image information fell, and there was a trouble of affecting the quality of the image reproduced in the wireless image terminal 277.

[0012] Furthermore, in the conventional wireless image communication system, while receiving image information, even if the wireless image terminal 277 moves to other communication link zones 276, a video server 271 cannot recognize this migration. Therefore, image information will continue being outputted to the communication link zone 276 in which it was located before this wireless image terminal's 277 moving. It becomes impossible moreover, for the wireless image terminal 277 to receive image information in the communication link zone 276 after migration. That is, unnecessary image information will be transmitted in the inside of a network 272, and there was a trouble that traffic increased.

[0013] So, the object of this invention is offering the wireless image communication system which can receive comfortably image information with a quality wireless image terminal. Moreover, other objects of this invention are offering the wireless image communication system which can use the channel for transmitting and receiving image information etc. effectively.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the whole wireless image communication system configuration concerning the 1st operation gestalt of this invention.

[Drawing 2] It is drawing showing a format of the packet used in the wireless image communication system shown in drawing 1.

[Drawing 3] The terminal office 5 shown in drawing 1 is drawing showing the situation (refer to arrow-head B) when coming from a situation (referring to arrow-head A) and a certain communication link zone 6 when close comes to a certain communication link zone 6 outside the service area from the outside of a service area.

[Drawing 4] It is the flow chart which shows actuation of the terminal office 5 shown in drawing 1.

[Drawing 5] It is the flow chart which shows actuation of the image radio station 3 shown in drawing 1.

[Drawing 6] It is the flow chart which shows actuation of the control radio station 4 shown in drawing 1.

[Drawing 7] It is the block diagram of the control radio station 7 in the 2nd operation gestalt of this invention.

[Drawing 8] It is the flow chart which shows actuation of the control radio station in the 2nd operation gestalt of this invention.

[Drawing 9] It is the flow chart which shows actuation of the image radio station in the 2nd operation gestalt of this invention.

[Drawing 10] It is the block diagram of the control radio station in the 3rd operation gestalt of this invention.

[Drawing 11] It is drawing showing the frame structure of the image information packet in the 3rd operation gestalt of this invention.

[Drawing 12] It is the flow chart which shows actuation of the terminal station in the 3rd operation gestalt of this invention.

[Drawing 13] It is the block diagram showing the configuration of the control radio station 13 concerning the 4th operation gestalt of this invention.

[Drawing 14] It is the flow chart which shows actuation of the terminal station 5 concerning the 4th operation gestalt of this invention.

[Drawing 15] It is the flow chart which shows actuation of the control radio station 13 shown in drawing 13.

[Drawing 16] It is the block diagram showing the configuration of the control radio station 16 concerning the 5th operation gestalt.

[Drawing 17] It is the flow chart which shows actuation of the control radio station 16 shown in drawing 16.

[Drawing 18] It is the block diagram showing the configuration of the control radio station 18 concerning the 6th operation gestalt.

[Drawing 19] It is the flow chart which shows actuation of the control radio station 18 shown in drawing 18.

[Drawing 20] It is the flow chart which shows actuation of the terminal station 5 concerning the 6th operation gestalt of this invention.

[Drawing 21] It is the block diagram showing the configuration of the control radio station 21 concerning the 7th operation gestalt of this invention.

[Drawing 22] It is the flow chart which shows actuation of the control radio station 21 shown in drawing 21.

[Drawing 23] It is the block diagram showing the configuration of the image radio station 23 concerning the 8th operation gestalt of this invention.

[Drawing 24] It is the flow chart which shows actuation of the image radio station 23 shown in drawing 23.

[Drawing 25] It is the block diagram showing the configuration of the image radio station 25 concerning the 9th operation gestalt of this invention.

[Drawing 26] It is the flow chart which shows actuation of the image radio station 25 shown in drawing 25.

[Drawing 27] It is the block diagram showing the conventional wireless image communication system whole configuration.

[Description of Notations]

1 — Video server

11 — Image information storing section

12 — File-sharing section

2 — Network

3, 23, 25 — Image radio station

231 — Image cache section

251 — Proper image information storing section

31 — File-sharing section

32 — Image information transmitting section

4, 7, 9, 13, 16, 18, 21 — Control radio station

41 — Control section

42 — Control information transmitting section

43 — Control information receive section

71 — Communication channel information storing section

91 — Menu storing section

131 — Positional information storing section

161 — Location hysteresis information storing section

181 — Zone map storing section

211 — Image hysteresis information storing section

5 — Terminal station

51 — Image information receive section

52 — Control information receive section

53 — Control information transmitting section

54 — Control section

6 — 1st communication link zone

7 — 2nd communication link zone

[Translation done.]

引用文献 2

(19) 日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平10-150460

(43) 公開日 平成10年(1998)6月2日

(51) Int.Cl.⁶
H 04 L 12/46
12/28
H 04 B 7/26
10/00
H 04 H 1/00

識別記号

F I
H 04 L 11/00 3 1 0 C
H 04 H 1/00 G
H 04 N 7/173
H 04 B 7/26 M
9/00 C

審査請求 未請求 請求項の数11 O.L (全 28 頁) 最終頁に続く

(21) 出願番号 特願平8-308538

(22) 出願日 平成8年(1996)11月19日

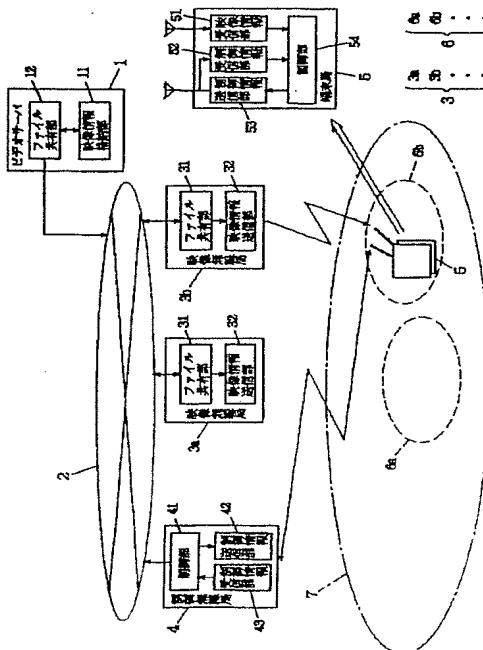
(71) 出願人 000005821
松下電器産業株式会社
大阪府門真市大字門真1006番地
(72) 発明者 松村 浩一
大阪府門真市大字門真1006番地 松下電器
産業株式会社内
(72) 発明者 松田 卓
大阪府門真市大字門真1006番地 松下電器
産業株式会社内
(72) 発明者 和田 哲也
大阪府門真市大字門真1006番地 松下電器
産業株式会社内
(74) 代理人 弁理士 小笠原 史朗

(54) 【発明の名称】 無線映像通信システム

(57) 【要約】

【課題】 無線映像端末が高品質な映像情報を快適に受信することができる無線映像通信システムを提供することである。

【解決手段】 ビデオサーバ1は、内部に格納している種々の映像情報を共有ファイルとして、ネットワーク上に公開する。端末局5は、自身が受信を希望する映像情報のタイトルを制御情報として、制御無線局4に第2の無線通信路を用いて送信する。制御無線局4は、端末局5から受信した制御情報を含まれる映像情報のタイトルを、映像無線局3に送信し、この映像情報を端末局5に送信するよう指示する。この指示に応答して、映像無線局3は、共有ファイルから当該指示に対応した映像情報を読み出し、第1の無線通信路を用いて端末局に送信する。



【特許請求の範囲】

【請求項1】 ビデオサーバ、制御無線局及び映像無線局がネットワークを介して接続されており、移動可能な端末局に対し、種々の映像情報を無線で配信する無線映像通信システムであって、

前記ビデオサーバは、複数種類の映像情報を内部に格納する複数種類の映像情報を、ネットワーク上で共有ファイルとして提供し、

前記端末局は、制御情報を第2の無線通信路を介して制御無線局に送信することにより、前記映像情報の送信を要求する旨及び自身が受信を希望する映像情報を通知し、

前記制御無線局は、前記第2の無線通信路を介して受信した制御情報に基づいて、前記端末局が受信を希望している映像情報を送信するようネットワークを介して前記映像無線局に指示し、

前記映像無線局は、前記ビデオサーバが格納する映像情報をネットワーク上で共有ファイルとして共有しており、前記制御無線局からの指示に対応する映像情報を前記共有ファイルから読み出して、前記第2の無線通信路と比較して広い帯域である第1の無線通信路に出力し、前記端末局は、前記映像無線局が送出した映像情報を、前記第1の無線通信路を介して受信する、無線映像通信システム。

【請求項2】 前記映像無線局は、映像情報を前記端末局に送信するために、前記第1の無線通信路内で、複数の通信チャネルを使用可能であり、

前記制御無線局は、

前記通信チャネルの現在の使用状況を監視しており、前記端末局からの制御情報を受信したとき、前記映像無線局が現在使用可能な通信チャネルを持つか否かを判断し、

前記映像無線局が現在使用可能な通信チャネルを持つと判断したときのみ、当該映像無線局に、前記端末局が受信を希望している映像情報を送信するよう指示することを特徴とする、請求項1に記載の無線映像通信システム。

【請求項3】 前記制御無線局は、前記映像無線局が現在使用可能な通信チャネルを持たないと判断したとき、前記制御情報を送信してきた端末局に、当該端末局が受信を希望する映像情報を送信することができない旨を通知することを特徴とする、請求項2に記載の無線映像通信システム。

【請求項4】 前記映像無線局は、複数台設置されており、かつ各々が通信可能な第1の通信ゾーンを有しており、自身が有する通信ゾーンに位置する端末局に映像情報を送信し、

前記制御無線局は、全ての映像無線局の第1の通信ゾーンをカバーする第2の通信ゾーン内で端末局と通信可能である、請求項2又は3に記載の無線映像通信システム。

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【請求項5】 各前記映像無線局は、自身を特定するために、前記映像無線局間で互いに重複しない第1の識別子を有しており、

前記制御無線局は、各前記映像無線局が端末局に送信可能な映像情報のタイトル情報を格納するメニュー情報格納手段を備え、

前記制御無線局は、前記端末局が現在位置する第1の通信ゾーンを有する映像無線局が送信可能な映像情報を通知するために、前記メニュー情報格納手段が格納しているタイトル情報に基づいて作成したメニュー情報と、当該タイトル情報に係る映像情報を送信可能な当該各映像無線局に割り当てられている識別子とを当該端末局に送信することを特徴とする、請求項4に記載の無線映像通信システム。

【請求項6】 前記端末局は、自身を特定するための第2の識別子を有しており、前記制御情報を送信することにより、自身の第2の識別子をも前記制御無線局に通知し、

20 前記制御無線局は、受信した制御情報により通知される第2の識別子及び第1の識別子とを、制御情報を送信した端末局の現在位置を示す情報として格納する位置情報格納手段をさらに備える、請求項5に記載の無線映像通信システム。

【請求項7】 前記制御無線局は、端末局からの制御情報を受信する度に、当該制御情報により通知される第2の識別子及び第1の識別子とを格納することにより、当該端末局が移動した経路を履歴情報として格納する位置履歴情報格納手段をさらに備える、請求項6に記載の無線映像通信システム。

【請求項8】 前記制御無線局は、少なくとも、各前記第1の通信ゾーンに隣接する第1の通信ゾーンを示す情報を、ゾーンマップとして格納するゾーンマップ格納手段をさらに備え、

前記制御無線局は、前記制御情報により通知される第1の識別子を有する無線映像局、及び、当該無線映像局が有する第1の通信ゾーンに隣接する第1の通信ゾーンを有する無線映像局が送信できる映像情報のタイトル情報に係るメニュー情報を端末局に送信する、請求項7に記載の無線映像通信システム。

【請求項9】 前記制御無線局は、前記端末局からの制御情報を受信する度に、当該制御情報によって通知された映像情報に係る情報を格納することにより、当該端末局が希望した映像情報の履歴を管理する映像履歴情報格納手段をさらに備える、請求項8に記載の無線映像通信システム。

【請求項10】 各前記映像無線局は、自身が送信できる映像情報の一部を格納する映像キャッシュ手段をさらに備え、

50 各前記映像無線局は、前記制御無線局の指示に応答して

送信する映像情報が、前記映像キャッシュ手段とに存在するとき、当該映像キャッシュ手段から映像情報を送信する、請求項1～9に記載の無線映像通信システム。

【請求項11】各前記映像無線局は、各映像上無線局毎で固有の映像情報を格納する固有情報格納手段をさらに備え、

各前記映像無線局は、前記制御無線局の指示に応答して送信する映像情報が、前記固有情報格納手段とに存在するとき、当該固有情報格納手段から映像情報を送信する、請求項1～10に記載の無線映像通信システム。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、無線映像通信システムに関し、より特定的には、移動可能な端末局に対し、種々の映像情報を無線通信路を用いて送信する無線映像通信システムに関する。

【0002】

【従来の技術】図27は、従来の無線映像通信システムの一構成例を示すブロック図である。図27において、無線映像通信システムは、ビデオサーバ271と、ネットワーク272を介してビデオサーバ271に接続された映像情報中継部273と、複数の無線LAN基地局275と、複数の無線映像端末277とを備えている。各無線LAN基地局275は、固有の通信ゾーン276を有しており、自局が有する通信ゾーン276内に位置する無線映像端末277とのみ通信可能に構成されている。無線映像端末277は、すべての通信ゾーン276からサービスエリアを自由に移動可能であり、かつ現在位置する通信ゾーン276を有する無線LAN基地局275と通信可能である。以下、本無線映像通信システムの各部の構成をより詳細に説明する。

【0003】ビデオサーバ271は、内部に格納している映像情報を無線映像端末277が検索できるように、映像情報のタイトル等を含むメニュー情報をすべての無線LAN基地局275へ送信する。また、ビデオサーバ271は、無線映像端末277からの要求に応答して、内部に格納している映像情報を無線映像端末277に配信する。ネットワーク272は、ビデオサーバ271から送信されてくるメニュー情報及び映像情報を映像情報中継部273へ伝送する。また、ネットワーク272は、映像情報中継部273によって収集された制御情報をビデオサーバ271に伝送する。

【0004】映像情報中継部273は、ビデオサーバ271が送信したメニュー情報や映像情報をネットワーク272を介して受信し、受信したメニュー情報や映像情報の内容に従って各無線LAN基地局275に対して振り分ける。また、映像情報中継部273は、各無線LAN基地局275から送信されてくる各無線映像端末277からの制御情報を収集して、ビデオサーバ271へ送信すべくネットワーク272に出力する。

【0005】各無線LAN基地局275は、直接的に無線映像端末277にメニュー情報や映像情報を送信する。また、無線LAN基地局275は、固有の通信ゾーン276内に位置する無線映像端末277から送信されてくる制御情報を収集し、映像情報中継部273へ出力する。無線映像端末277は、無線LAN基地局275から配信されてくるメニュー情報から、送信を希望する映像情報を決定した後、ビデオサーバ271に対して決定した映像情報の送信要求を含む制御情報を無線LAN基地局275に出力する。また、無線映像端末277は、ビデオサーバ271に対して送信要求した映像情報を映像等として再生する。

【0006】上述のような構成を有する無線映像通信システムにおいて、無線映像端末277がビデオサーバ271から映像情報の配信を受けるまでの手順を、以下、詳細に説明する。上述したように、ビデオサーバ271は、すべての無線LAN基地局275に対応するメニュー情報を出力する。映像情報中継部273は、メニュー情報をネットワーク272を介して入力したメニュー情報を無線LAN基地局275毎に振り分け、対応する無線LAN基地局275に出力する。各無線LAN基地局275は、映像情報中継部273から入力したメニュー情報を、自局が有する通信ゾーン276に送出する。

【0007】無線映像端末277は、通信ゾーン276に進入したとき、当該通信ゾーン276内に送出されているメニュー情報を受信する。無線映像端末277は、受信したメニュー情報の中に、送信を希望する映像情報があると、当該映像情報の送信要求を含む制御情報を生成して無線LAN基地局275に出力する。この制御情報は、無線LAN基地局275、映像情報中継部273及びネットワーク272を伝送されていき、ビデオサーバ271によって受信される。ビデオサーバ271は、制御情報を受信すると、無線映像端末277が映像情報の送信を要求していることを認識する。ビデオサーバ271は、内部に格納している映像情報を検索して、無線映像端末277が要求している映像情報を取り出し、当該映像情報をネットワーク272に出力する。この映像情報は、ネットワーク272、映像情報中継部273及び無線LAN基地局275を伝送されていき、無線映像端末277によって受信される。無線映像端末277は、受信した映像情報を映像等として出力する。

【0008】

【発明が解決しようとする課題】

【0009】従来の無線映像通信システムでは、各無線LAN基地局275は、制御情報及び映像情報の送受信処理を行う。映像情報及び制御情報は、同一の通信路を用いて伝送されるため、各無線LAN基地局275は、映像情報の送受信処理と、制御情報の送受信処理とを同時に行うことができない。従って、各無線LAN基地局275は、映像情報の送受信処理を行っている最中に、

制御情報が無線映像端末277から送信されると、当該映像情報の送受信処理を中断して、受信した制御情報を映像情報中継部273に送信する処理を実行しなければならない。これでは、映像情報の伝送速度が低下し、無線映像端末277において受信映像の途切れが生じるという問題点があった。かかる問題点は、特に、同一の通信ゾーン276内に多数の無線映像端末277が位置し、複数の無線映像端末277から一斉に制御情報が送信されたときに深刻なものとなる。

【0010】また、従来の無線映像通信システムでは、ビデオサーバ271が内部に格納している映像情報が更新されると、メニュー情報もまた新たなものに更新されなければならない。従って、本無線映像通信システム運用中に、映像情報が更新されると、ビデオサーバ271は、映像情報の送信処理を中断してメニュー情報の再構成を行わなければならない。そのため、ビデオサーバ271が映像情報を送出する際、そのスルーブットが低下するという問題点があった。

【0011】また、従来の無線映像通信システムでは、ネットワーク272に複数のビデオサーバ271が接続された場合、メニュー情報には、映像情報のタイトル等の他に、タイトルによって特定される映像情報がどのビデオサーバ271に格納されているかを示す情報を含ませる必要がある。従って、各無線LAN基地局275から無線映像端末277に伝送される制御情報のデータ量が増加する。このデータ量の増加が起因して、映像情報の伝送速度が低下し、無線映像端末277において再生される映像の品質に影響を与えるという問題点があった。

【0012】さらに、従来の無線映像通信システムでは、無線映像端末277が映像情報を受信中に、他の通信ゾーン276へ移動しても、ビデオサーバ271は、かかる移動を認識できない。従って、映像情報は、この無線映像端末277が移動前に位置していた通信ゾーン276に出力され続けることとなる。また、無線映像端末277は、移動後の通信ゾーン276において、映像情報を受信できなくなる。すなわち、無用の映像情報がネットワーク272内を伝送されることとなり、トラフィックが増加するという問題点があった。

【0013】それゆえに、本発明の目的は、無線映像端末が高品質な映像情報を快適に受信することができる無線映像通信システムを提供することである。また、本発明の他の目的は、映像情報等を送受信するための通信路を有効利用することができる無線映像通信システムを提供することである。

【0014】

【課題を解決するための手段及び効果】第1の発明は、ビデオサーバ、制御無線局及び映像無線局がネットワークを介して接続されており、移動可能な端末局に対し、種々の映像情報を無線で配信する無線映像通信システム

であって、ビデオサーバは、複数種類の映像情報を内部に格納する複数種類の映像情報を、ネットワーク上で共有ファイルとして提供し、端末局は、制御情報を第2の無線通信路を介して制御無線局に送信することにより、映像情報の送信を要求する旨及び自身が受信を希望する映像情報を通知し、制御無線局は、第2の無線通信路を介して受信した制御情報に基づいて、端末局が受信を希望している映像情報を送信するようネットワークを介して映像無線局に指示し、映像無線局は、ビデオサーバが

10 格納する映像情報をネットワーク上で共有ファイルとして共有しており、制御無線局からの指示に対応する映像情報を共有ファイルから読み出して、第2の無線通信路と比較して広い帯域である第1の無線通信路に出力し、端末局は、映像無線局が送出した映像情報を、第1の無線通信路を介して受信する。

【0015】第1の発明によれば、制御無線局は、第2の無線通信路からの端末局からの制御情報を受信し、映像無線局は、第1の無線通信路を用いて端末局に映像情報を送信する。このように、制御無線局及び映像無線局が用いる通信路を異ならせることにより、映像無線局は、映像情報を送信するという役割のみを果たせばよい。そのため、映像無線局の負荷が低くなる。さらに、映像無線局はビデオサーバによりネットワーク上で映像情報を共有ファイルとして共有するため、ネットワーク上には、不必要的伝送信号が送出されたりすることがない。これによって、ネットワークが輻輳状態に陥る可能性を低くすることができる。

【0016】第2の発明は、第1の発明において、映像無線局は、映像情報を端末局に送信するために、第1の無線通信路内に、複数の通信チャネルを使用可能であり、制御無線局は、通信チャネルの現在の使用状況を監視しており、端末局からの制御情報を受信したとき、映像無線局が現在使用可能な通信チャネルを持つか否かを判断し、映像無線局が現在使用可能な通信チャネルを持つと判断したときのみ、当該映像無線局に、端末局が受信を希望している映像情報を送信するよう指示することを特徴とする。

【0017】第2の発明によれば、各映像無線局には複数の通信チャネルが設けられている。制御無線局は、各映像無線局による通信チャネルの使用状況を管理しており、映像無線局が現在使用可能な通信チャネルを持つと判断したときのみ、当該映像無線局に、端末局が受信を希望している映像情報を送信するよう指示する。つまり、映像無線局が現在使用可能な通信チャネルを持たないときには、たとえ端末局から映像情報の要求があったとしても、その映像情報の送信を映像無線局に指示しない。そのため、無用な信号がネットワーク上に送出されることはなくなり、これによって、ネットワークが輻輳状態に陥る可能性を低くすることができる。

【0018】第3の発明は、第2の発明において、制御

無線局は、映像無線局が現在使用可能な通信チャネルを持たないと判断したとき、制御情報を送信してきた端末局に、当該端末局が受信を希望する映像情報を送信することができない旨を通知することを特徴とする。

【0019】第3の発明によれば、制御無線局は、映像無線局が現在使用可能な通信チャネルを持たないと判断したとき、制御情報を送信してきた端末局に、当該端末局が受信を希望する映像情報を送信することができない旨を通知する。この通知によって、端末局は、制御情報を第2の無線通信路を介して制御無線局に送信することにより、映像情報の送信を要求する旨及び自身が受信を希望する映像情報を再度通知することができるなどすることができ、使い勝手のよい無線映像通信システムを提供することができるようになる。

【0020】第4の発明は、第2又は第3の発明において、映像無線局は、複数台設置されており、かつ各々が通信可能な第1の通信ゾーンを有しており、自身が有する通信ゾーンに位置する端末局に映像情報を送信し、制御無線局は、全ての映像無線局の第1の通信ゾーンをカバーする第2の通信ゾーン内で端末局と通信可能である。

【0021】第4の発明によれば、複数台の映像無線局を設置することができるようになり、広範囲にわたって映像情報を送信することができる。

【0022】第5の発明は、第4の発明において、各映像無線局は、自身を特定するために、映像無線局間で互いに重複しない第1の識別子を有しており、制御無線局は、各映像無線局が端末局に送信可能な映像情報のタイトル情報を格納するメニュー情報格納手段を備え、制御無線局は、端末局が現在位置する第1の通信ゾーンを有する映像無線局が送信可能な映像情報を通知するため、メニュー情報格納手段が格納しているタイトル情報に基づいて作成したメニュー情報と、当該タイトル情報に係る映像情報を送信可能な当該各映像無線局に割り当てられている識別子とを当該端末局に送信することを特徴とする。

【0023】第5の発明によれば、ビデオサーバがメニュー情報を作成するのではなく、制御無線局がメニュー情報を作成し、第2の無線通信路を用いて端末局に送信することにより、ネットワーク上の伝送信号を減らすことができる。これによって、ネットワークが輻輳状態に陥る可能性を低くすることができる。さらに、ビデオサーバが映像情報送信中にメニュー情報を作成するということがなくなり、端末局に送信される映像情報が途切れたりしなくなる。

【0024】第6の発明は、第5の発明において、端末局は、自身を特定するための第2の識別子を有しており、制御情報を送信することにより、自身の第2の識別子をも制御無線局に通知し、制御無線局は、受信した制御情報により通知される第2の識別子及び第1の識別子

とを、制御情報を送信した端末局の現在位置を示す情報として格納する位置情報格納手段をさらに備える。

【0025】第6の発明によれば、制御無線局は、端末局が現在位置する第1の通信ゾーンを、映像無線局の第1の識別子を用いて管理することができる。これによって、端末局が現在位置する第1の通信ゾーンを有する映像無線局は、確実に映像情報を当該端末局に送信することができる。

【0026】第7の発明は、第6の発明において、制御無線局は、端末局からの制御情報を受信する度に、当該制御情報により通知される第2の識別子及び第1の識別子とを格納することにより、当該端末局が移動した経路を履歴情報として格納する位置履歴情報格納手段をさらに備える。

【0027】第7の発明によれば、制御無線局は、端末局から制御情報を受信する度に、当該制御情報により通知される第2の識別子及び第1の識別子とを格納する。そのため、位置履歴情報格納手段は、端末局が移動してきた経路を第1の識別子を用いて管理することとなり、端末局を携帯するユーザの移動経路に関する統計などをとることができるようになる。

【0028】第8の発明は、第7の発明において、制御無線局は、少なくとも、各第1の通信ゾーンに隣接する第1の通信ゾーンを示す情報を、ゾーンマップとして格納するゾーンマップ格納手段をさらに備え、制御無線局は、制御情報により通知される第1の識別子を有する無線映像局、及び、当該無線映像局が有する第1の通信ゾーンに隣接する第1の通信ゾーンを有する無線映像局が送信できる映像情報のタイトル情報に係るメニュー情報を端末局に送信する。

【0029】第8の発明によれば、制御無線局は、第1の通信ゾーン及びこれに隣接して配置される第1の通信ゾーンを示すゾーンマップを予め管理しており、端末局にメニュー情報を送信する際、当該端末局が現在位置する第1の通信ゾーンを有する映像無線局のメニュー情報だけでなく、これに隣接する第1の通信ゾーンを有する映像無線局のメニュー情報をも送信する。これによって、端末局が次回位置することとなると考えられる第1の通信ゾーンをメニュー情報を送信する必要がなくなり、端末局がメニュー情報を得るまでのレスポンス時間を短くすることができる。

【0030】第9の発明は、第8の発明において、制御無線局は、端末局からの制御情報を受信する度に、当該制御情報によって通知された映像情報に係る情報を格納することにより、当該端末局が希望した映像情報の履歴を管理する映像履歴情報格納手段をさらに備える。

【0031】第9の発明によれば、制御無線局は、端末局から制御情報を受信する度に、当該制御情報により通知される映像情報に係る情報を格納する。そのため、映像履歴情報格納手段は、各端末局が要求した映像情報の

履歴を管理することができる。

【0032】第10の発明は、第1～第9の発明において、各映像無線局は、自身が送信できる映像情報の一部を格納する映像キャッシュ手段をさらに備え、各映像無線局は、制御無線局の指示に応答して送信する映像情報が、映像キャッシュ手段に存在するとき、当該映像キャッシュ手段から映像情報を送信する。

【0033】第10の発明によれば、映像無線局は、自身が送信できる映像情報の一部を映像キャッシュ手段に格納しておき、制御無線局の指示に応答して送信する映像情報が、映像キャッシュ手段に存在するとき、当該映像キャッシュ手段から映像情報を送信する。これによって、映像無線局が共有ファイルから映像情報を読み出すまでは、映像キャッシュ手段に格納されている映像情報を端末局に送信することができ、端末局による映像情報の要求から再生までのレスポンス時間を短くすることができる。

【0034】第11の発明は、第1～10の発明において、各映像無線局は、各映像無線局毎で固有の映像情報を格納する固有情報格納手段をさらに備え、各映像無線局は、第1の無線通信路において、予め定められた通信チャネルを用いて固有の映像情報を送信し、端末局は、制御情報を制御無線局に送信するまで、予め定められた通信チャネルを介して固有の映像情報を受信する。

【0035】第11の発明によれば、各映像無線局は、各映像無線局毎で固有の映像情報を固有情報格納手段に格納しておき、制御無線局の指示に応答して送信する映像情報が、固有情報格納手段に存在するとき、当該固有情報格納手段から映像情報を送信する。これによって、映像無線局は、固有の映像情報の送信指示がされたとき、共有ファイルから映像情報を読み出すことがなくなる。そのため、ネットワーク上の伝送信号を少なくすることができ、ネットワークが輻輳状態に陥る可能性を低くすることができる。

【0036】

【発明の実施の形態】図1は、本発明の第1の実施形態に係る無線映像通信システムの全体構成を示すブロック図である。図1において、無線映像通信システムは、ビデオサーバ1と、ネットワーク2と、複数の映像無線局3と、少なくとも1つの制御無線局4と、複数の端末5とを備えている。ネットワーク2は、ビデオサーバ1と、各映像無線局3と、制御無線局4とを、相互に通信可能に接続する。

【0037】ビデオサーバ1は、ファイル格納部11とファイル共有部12とを含む。ファイル格納部11は、例えば、MPEG1 (Motion Picture Experts Group 1) の規格に則って画像圧縮された複数の映像情報を格納する。ファイル共有部12は、ファイル格納部11に格納された映像情報を、例えば、Network File System (以

下、「NFS」と略記する。なお、「Network File System」と「NFS」は、Sun Microsystems社の登録商標である。) にマウント可能なファイルとしてネットワーク2に公開する。このNFSのプロトコルは、「Internet Engineering Task Force」がRFC (Request For Comments) として公開している「RFC1813」に記されているため、NFSの詳細な説明を省略する。

10 【0038】各映像無線局3は、映像無線局3毎で互いに重複しない識別番号(以下、「ID」と称する)を有しており、ファイル共有部31と、映像情報送信部32とを含む。ファイル共有部31は、NFSマウントを行うことによって、ビデオサーバ1が内部に格納している映像情報を、ネットワーク2上で共有し、制御無線局4によって指示される映像情報を読み出して、映像情報送信部32に出力する。映像情報送信部32は、ファイル共有部31が読み出した映像情報を、予め定められたサイズのブロックに分割した後、映像情報パケット(図2(a)参照)を作成する。さらに、電気信号である映像情報パケットを光信号に変換し、この光信号を時分割多重化などして第1の無線通信路に送出する。ここで、第1の無線通信路には、映像情報のデータ量の大きさと高速の伝送レートが要求されることとを考慮して、光を用いることが好ましい。また、映像無線局3は、それぞれ固有の第1の通信ゾーン6を有しており、自局が有する第1の通信ゾーン6内に位置する端末局5に映像情報パケットを送信する。ここで、各第1の通信ゾーン6は、好ましくは、互いにオーバーラップしないように配置される。なお、図中、映像無線局3は2つ示されているが、以下の説明においては、図示したように、無線映像局3a、3bと称し、この映像無線局3a及び3bは、第1の通信ゾーン6a及び6bを有することとする。

【0039】制御無線局4は、制御部41と、制御情報送信部42と、制御情報受信部43とを含む。制御部41は、ビデオサーバ1が格納している映像情報の全タイトルを、映像無線局3が配信可能な映像情報のタイトル別に分けて、内部に格納しており、さらに、後述するフローチャートに従う動作を実行する。また、制御無線局4は、少なくとも全ての第1の通信ゾーン6を内部に含む様の第2の通信ゾーン7を有しており、当該第2の通信ゾーン7内に位置する端末局5との間で、制御情報の授受を第2の無線通信路を用いて行う。ここで、第2の無線通信路には、データ量の大きな映像情報が送出されない。そのため、第2の無線通信路は、第1の無線通信路のような広帯域性を必要としないため、電波が用いられる。

【0040】各端末局5は、互いに重複しない識別番号(以下、「ID」と称する)を有しており、映像情報受信部51と、制御情報受信部52と、制御情報送信部5

3と、制御部54とを含む。映像情報受信部51は、映像無線局3からの映像情報パケット（図2（a）参照）を、第1の無線通信路から受信する。制御情報受信部52は、制御無線局4からの制御情報（映像情報のタイトルを含むものなど）を受信する。制御情報送信部53は、制御情報として、映像要求パケット（図2（b）参照）又はコマンドパケット（図2（c）参照）を、制御無線局4に第2の無線通信路を介して送信する。制御部54は、後述するフローチャートに従う動作を実行する。

【0041】図2は、本実施形態に係る無線映像通信システムにおいて用いられるパケットのフォーマットを示す図である。図2（a）は、図1に示す映像無線局3が送出する映像情報パケットのフォーマットを示している。図2（a）において、映像情報パケットは、映像無線局ID部2221と、端末局ID部2222と、映像情報部2223とを含む。映像無線局ID部2221には、映像情報パケットを送信する映像無線局3のIDが格納される。端末局ID部2222には、映像情報パケットを受信する端末局5のIDが格納される。映像情報部2223には、映像情報を分割したブロック（上述）が格納される。図2（b）は、図1に示す端末局5が送出する映像要求パケットのフォーマットを示す図である。図2（b）において、映像要求パケットは、識別コード部2224と、端末局ID部2225と、映像無線局ID部2226と、要求映像部2227とを含む。識別コード部2224には、映像要求パケットであることを特定するための第1の識別コードが格納される。端末局ID部2225には、映像要求パケットによって映像情報を要求する端末局5のIDが格納される。映像無線局ID部2226には、端末局5が現在位置する第1の通信ゾーン6を有する映像無線局3のIDが格納される。要求映像部2227には、ユーザが選択した映像情報のタイトルが格納される。図2（c）は、図1に示す端末局5が送信するコマンドパケットのフォーマットを示している。図2（c）において、コマンドパケットは、識別コード部2228と、端末局ID部2229と、映像無線局ID部2230と、コマンド部2231とを含む。識別コード部2228には、コマンドパケットであることを特定するための第2の識別コードが格納される。端末局ID部2229には、コマンドパケットを作成した端末局5のIDが格納される。映像無線局ID部2230は、コマンド部2231に格納される命令を実行すべき映像無線局3のIDが格納される。コマンド部2231は、例えば、映像情報の送信の中断を要求するためのコマンド（以下、「中断命令」と称する）などを含む。なお、コマンド部2231は、他のコマンドも含む場合があるが、それについては、必要に応じて適宜説明することとする。図2（d）は、図1に示す端末局5が送信するタイトル要求パケットのフォーマットを

示している。図2（d）において、タイトル要求パケットは、識別コード部2232と、端末局ID部2233と、映像無線局ID部2234と、タイトル要求部2235とを含む。識別コード部2232には、タイトル要求パケットであることを特定するための第3の識別コードが格納される。端末局ID部2233は、タイトル要求パケットを作成した端末局5のIDが格納される。映像無線局ID部2234には、端末局5が現在位置する第1の通信ゾーン6を有する映像無線局3のIDが格納される。タイトル要求部2235は、制御無線局4に映像情報のタイトルを要求するためのコマンド（以下、「タイトル要求」と称する）を含む。

【0042】図3は、図1に示す無線映像通信システムの動作を説明するための図であって、端末局5の移動経路（矢印A及びB参照）を示す図である。図5において、端末局5は、移動経路の一例として、以下に説明するような経路を辿るものとする。端末局5（ドットを付したもの）は、当初、第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所に位置していた。その後、端末局5は移動し（矢印A参照）、第1の通信ゾーン6bに進入した。その後、端末局5（斜線を付したもの）は、再度、第1の通信ゾーン6bから第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと離脱する（矢印B参照）。

【0043】図4、5及び6は、図1に示す端末局5、映像無線局3及び制御無線局4の動作を示すフローチャートである。以下、図1～6を参照して、本無線映像通信システムの動作を詳細に説明する。

【0044】端末局5の携帯するユーザは、当初、第2の通信ゾーン7内であって、どの第1の通信ゾーン6にも属しない場所に位置していたが、第1の通信ゾーン6bに進入した（図3：矢印A参照）。第1の通信ゾーン6bには、光信号に変換された映像情報パケット（図2（a）参照）が、映像無線局3bから他の端末局に向けて送出されている。

【0045】端末局5の映像情報受信部51は、映像無線局3bからの光信号を、第1の無線通信路を介して受信し、電気信号に変換し出力する。制御部54は、映像情報受信部51から電気信号を入力（図4；ステップS401）したことから、当該電気信号が映像情報パケットであると判断し、これが自局宛の映像情報パケットか否かを判断する（ステップS402）。かかる判断は、映像情報パケットの端末局ID部2222に自局のIDが格納されているか否かに基づいて行われる。現時点では、他の端末局のIDが格納されているため、制御部54はステップS403に移行する。

【0046】次に、制御部54は、ディスプレイ（図示せず）の制御状態等に基づいて、映像情報のタイトルがディスプレイに表示されているか否かを判断する（ステップS403）。現時点では、映像情報のタイトルがデ

ディスプレイに表示されていないため、制御部54はステップS404に移行する。次に、制御部54は、内部のメモリ(図示せず)に格納されているフラグを参照して、既に映像情報のタイトルを要求したか否かを判断する(ステップS404)。ここで、フラグとは、映像情報のタイトルを要求しているか否かを示すためのものであり、現時点では、映像情報のタイトルを要求していないことを示している。そのため、制御部54はステップS405に移行する。次に、制御部54は、映像情報パケットの映像無線局ID部2221に格納されているID、つまり、映像無線局3bのIDを取り出す(ステップS405)。この後、制御部54は、タイトル要求パケット(図2(d)参照)を作成する。このタイトル要求パケットにおいて、映像無線局ID部2234には、映像無線局3bのIDが格納される。他の部分2232、2233及び2235については上述したとおりであるので、それぞれの説明を省略する。このタイトル要求パケットは、制御情報送信部53から第2の無線通信路を介して制御無線局4に送られる。このようにして、端末局5は、映像情報のタイトルを要求する(ステップS406)。

【0047】制御無線局4の制御情報受信部43は、第2の無線通信路からの信号を受信し、制御部41に出力する。制御部41は、入力信号であるパケットの識別コード部を解析することにより、タイトル要求パケットであるか否かを判断する(図6;ステップS601)。このパケットの識別コード部には第3の識別コードが格納されているため、制御部41はタイトル要求パケットであると判断し、ステップS602に移行する。次に、制御部41は、タイトル要求パケットの端末局ID部2233及び映像無線局ID部2234から、端末局5のID及び映像無線局3bのIDを取り出す。制御部41は、内部で管理している映像情報の全タイトルの中から、映像無線局3bが送信可能な映像情報のタイトルを選択し、制御情報送信部42に出力する。制御情報送信部42は、入力した映像情報のタイトルを第2の無線通信路に送出する。このようにして、制御無線局4は、端末局5からの要求に応答して、映像情報のタイトルを端末局5に送信する(ステップS602)。

【0048】端末局5の制御部54は、制御情報受信部52が受信した信号を入力すると(図4;ステップS401)、前述したステップS402の処理を実行する。制御部54は、制御情報受信部52から入力した信号について、自局宛の映像情報パケットであるか否かを判断せず即座にステップS403に移行する。制御部54は、前述したステップS403及びS404の処理を実行する。つまり、制御部54は、現在タイトルを表示していないと判断し(ステップS403)、さらに、既に映像情報のタイトルを要求したと判断して(ステップS404)、ステップS407に移行する。制御部54

は、ステップS407に移行すると、入力信号を映像情報のタイトルと判断し、これをディスプレイに表示させる(ステップS407)。これによって、端末局5のユーザーは、視聴可能な映像情報、つまり映像無線局3bが送信可能な映像情報のタイトルを得る。端末局5のユーザーは、入力操作器(図示せず)を操作して、ディスプレイに表示された映像情報のタイトルの中から、視聴したい映像情報のタイトルを選択する。入力操作器は、ユーザーの操作に応答して、選択された映像情報のタイトルを示す信号を制御部54に出力する。制御部54は、入力操作器からの信号を入力する(ステップS401)。この入力信号は、映像情報パケットではないと判断される(ステップS402)。制御部54は、ステップS403の処理によって、現在タイトルを表示していると判断するため(ステップS403)、ステップS408に移行する。これによって、制御部54は、入力信号が映像情報のタイトルを示す信号であると判断し、映像要求パケット(図2(b)参照)を作成する。この映像要求パケットにおいて、映像無線局ID部2226には映像無線局3bのIDが格納される。他の部分2224、2225及び2227については、前述と同様であるため、その説明を省略する。この映像要求パケットは、制御情報送信部53から第2の無線通信路を介して制御無線局4に送られる(ステップS408)。

【0049】制御無線局4の制御情報受信部43は、第2の無線通信路からパケットを受信し、制御部41に出力する。制御部41は、このパケットの識別コード部には第1の識別コードが格納されているため、当該パケットをタイトル要求パケットではないと判断する(図6;ステップS601)。次に、制御部41は、入力したパケットが映像要求パケットであるか否かを判断する(ステップS603)。制御部41は、このパケットの識別コード部には第1の識別コードが格納されていることから、当該パケットを映像要求パケットと判断する。次に、制御部41は、映像要求パケットの端末局ID部2225、映像無線局ID部2226及び要求映像部2227に格納されている端末局のID、映像無線局3bのID及び映像情報のタイトルを取り出す(ステップS604)。次に、制御部41は、内部で管理している共有ファイルのファイル名(映像情報のタイトル)の中から、ステップS604の処理で取り出した映像情報のタイトルに対応するファイル名を取り出す(ステップS605)。次に、制御部41は、ステップS604の処理で取り出した端末局及び映像無線局3bのIDと、ステップS605の処理で取り出したファイル名とを、制御情報送信部42に出力する。制御情報送信部42は、端末局5及び映像無線局3bのIDと、ファイル名とを、映像無線局3bに通知すべく(ステップS606)、ネットワーク2に出力する。

【0050】各映像無線局3のファイル共有部31は、

ネットワーク2からの信号を受信すると、この信号が自局宛のものであるか否かを、当該信号が内部に含む映像無線局のIDを参照して判断する。したがって、映像無線局3bが自局宛の信号と判断し、以下の処理を実行する。映像無線局3bのファイル共有部31は、受信信号中に中断命令が含まれるか否かを判断する(図5;ステップS501)。上述から明らかなように、この受信信号は、端末局5及び映像無線局3bのIDとファイル名とを含んでおり、中断命令を含まないので、ファイル共有部31は、ステップS502に移行する。次に、ファイル共有部31は、受信信号に含まれるファイル名に対応する共有ファイルをオープンし、このファイルに含まれる映像情報と、受信信号に含まれている端末局5及び映像無線局3bのIDとを、映像情報送信部32に出力する。映像情報送信部32は、映像情報などを入力すると、映像情報パケット(図2(a)参照)を作成する。この映像情報パケットにおいて、映像無線局ID部2221には映像無線局3bのIDが格納される。他の部分2222及び2223については前述したとおりであるため、それぞれの説明を省略する。映像情報送信部32は、この映像情報パケットを光信号に変換し時分割多重化して、端末局5に第1の無線通信路を用いて送信する(ステップS502)。

【0051】端末局5の映像情報受信部51は、前述したように、第1の無線通信路からの受信光信号を電気信号に変換し、制御部54に出力する。制御部54は、この電気信号を入力し(図4;ステップS401)、この電気信号が映像情報パケットであると判断する。次に、制御部54は、このパケットの端末局ID部2222か自局のIDを検出し、これによって、当該パケットが自局宛のものであると判断し(ステップS402)、ステップS409に移行する。次に、制御部54は、映像情報パケットの映像情報部2223に格納されている映像情報を、ディスプレイに表示させる(ステップS409)。これによって、端末局5のユーザは、選択した映像情報を視聴することができる。

【0052】その後、端末局5は、映像表示中に、第1の通信ゾーン6bから、第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと離脱した。端末局5の映像情報受信部51は、上記のような場所に離脱すると、光信号を受信不可能になる。制御部54は、映像情報受信部51が映像情報パケットを受信不可能なことを検出すると(ステップS401)、ステップS410に移行する。次に、制御部54は、ディスプレイ(図示せず)の制御状態などに基づいて、映像情報をディスプレイに表示中であったか否かを判断する(ステップS410)。制御部54は、現時点では、表示中と判断するので、ステップS411に移行する。次に、制御部54は、コマンドパケット(図2(c)参照)を作成する。このコマンドパケットにおいて、映像

無線局ID部2230にはコマンド部2231に格納される「中断命令」(前述)を実行すべき映像無線局3bのIDが格納される。他の部分2280、229及び2231については前述したとおりであるため、それぞれの説明を省略する。制御情報送信部53は、このコマンドパケットを第2の無線通信路に送出する(ステップS411)。

【0053】制御無線局4の制御情報受信部43は、第2の無線通信路からの信号を受信し、制御部41に出力する。制御部41は、入力信号であるパケットの識別コード部を解析し、このパケットがタイトル要求パケットでないと判断し(図6;ステップS601)、さらに、映像要求パケットでないと判断する(ステップS603)。次に、制御部41は、ステップS607に移行し、このパケットがコマンドパケットか否かを判断する(ステップS607)。上述したように、制御部41は、第2の識別コードに基づいて、受信パケットをコマンドパケットと判断し、S608に移行する。次に、制御部41は、コマンドパケットに格納されている端末局5及び映像無線局3bのIDと「中断命令」とを取り出して制御情報送信部42に出力する。制御情報送信部42は、入力した端末局ID、映像無線局ID及び中断命令をネットワーク2に出力し、映像無線局3bに対して映像情報パケットの中断通知をする(ステップS608)。

【0054】各映像無線局3のファイル共有部31は、ネットワーク2からの受信信号が、自局宛の信号か否かを、前述と同様にして判断する。したがって、映像無線局3bが自局宛の信号と判断し、以下に説明する処理を実行する。映像無線局3bのファイル共有部31は、受信信号中に中断命令が含まれるか否かを判断する(図5;ステップS501)。上述から明らかなように、この受信信号には中断命令が含まれているので、ファイル共有部31は、ステップS503に移行する。次に、ファイル共有部31は、中断処理を実行する(ステップS503)。つまり、ファイル共有部31は、受信信号に含まれる端末局のIDに対応する端末局向けの共有ファイルの読み出しを中断し、クローズする。これに伴い、映像情報送信部32は、映像情報パケットの作成を停止する。

【0055】次に、端末局5は、映像非表示中に、第1の通信ゾーン6bから第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと映像を表示していない時に離脱した。端末局5の映像情報受信部51は、上記のような場所に離脱すると、光信号を受信不可能となる。制御部54は、映像情報受信部51からの入力信号がないと判断すると(ステップS401)、ステップS410に移行する。その後、制御部54は、映像情報がディスプレイに表示中であったか否かを判断する(ステップS410)。制御部54は、表示

中でないと判断するので、ステップS412に移行し、ディスプレイに現在表示中であるタイトルの表示を終了させ（ステップS412）、映像情報受信部51又は制御情報受信部52が伝送信号又は光信号を受信することを待機する。

【0056】次に、本発明の第2の実施形態に係る無線映像通信システムについて説明する。本無線映像通信システムは、第1の実施形態に係る無線映像通信システムと比較して、制御無線局4と内部構成が相違する制御無線局7を備える点のみが異なる。そのため、本システムの全体構成の図示を省略し、さらに、この相違点以外の構成については、第1の実施形態において相当する部分と同一の参照番号を付し、この相違点以外の説明を簡素化する。図7は、上述した制御無線局7の構成を示すブロック図である。図7において、制御無線局7の構成は、図1に示す制御無線局4の構成と比較して、通信チャネル情報格納部71をさらに含む点のみが異なる。それ以外の構成については同様であるため、相当する構成については同一の参照番号を付すこととする。通信チャネル情報格納部71は、各映像無線局3毎の通信チャネルの使用状況に関するを格納する。つまり、各映像無線局3は、予め定められた数の通信チャネルを有しており、この通信チャネルのいずれかを用いて端末局5に映像情報パケットを送信する。通信チャネル情報格納部71は、本システムの初期状態においては、各映像無線局3が予め有する通信チャネルの数を、それそれにおける空き通信チャネルの数として保持する。空き通信チャネルの数は、制御部41が映像要求パケットまたはコマンドパケット（「中断命令」）を入力する毎に更新される（詳細は後述する）。

【0057】図8は、図7に示す制御無線局7の動作を示すフローチャートである。図8において、制御無線局7が実行する動作は、図6に示した制御無線局4の動作と比較して、ステップS801、S802、S803及びS804をさらに含む点で異なる。それ以外の動作については同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。

【0058】以下、第1の実施形態と同様に、端末局5が図3に示す移動経路を辿った際の、本システムの動作について説明する。まず、本システムの初期状態において、通信チャネル情報格納部71は、各映像無線局3が有している通信チャネルの数を、それそれにおける空き通信チャネルの数として保持する。

【0059】端末局5は、第1の通信ゾーン6bに進入すると、まず、映像情報のタイトルを制御無線局7に要求する（図4；ステップS401～S406）。この要求に応答して、制御無線局7は、映像情報のタイトルを第2の無線通信路を用いて端末局5に送信する（図8；ステップS601、S602）。端末局5は、制御無線局7から送られてくる映像情報のタイトルをディスプレ

イに表示させる（図4；ステップS401～S404、S406）。その後、端末局5は、ユーザの希望に応じた映像情報を映像無線局3bに要求すべく映像要求パケットを送信する（図4；ステップS401～S403及びS408）。制御無線局7の制御部41は、ステップS601及びS603の動作を実行して入力信号を映像要求パケットと判断し、ステップS604に移行する。次に、制御部41は、映像要求パケットの端末局ID部2225、映像無線局ID部2226及び要求映像部2227に格納されている端末局のID、映像無線局3bのID及び映像情報のタイトルを取り出して保持する（ステップS604）。次に、制御部41は、通信チャネル情報格納部71を検索して、ステップS604で取り出した映像無線局のIDにより特定される映像無線局3bの空きチャネル数を検出する。制御部41は、検出した空きチャネル数に基づいて、映像無線局3bが現在空きチャネルを有しているか否かを判断する（ステップS801）。つまり、制御部41は、検出した空きチャネル数が「0」を示していないければ、映像無線局3bが端末局5からの映像要求に応えることができると判断する。次に、制御部41は、通信チャネル情報格納部71が現在格納している映像無線局3bの空きチャネル数を、「（検出した空きチャネル数）-1」に更新する（ステップS802）。次に、制御部41は、ステップS605及びS606の処理を実行し、端末局のID、映像無線局3bのID及びファイル名を、ネットワーク12に出力する（ステップS606）。

【0060】ネットワーク2からの信号を受信するのは、映像無線局3bのみである。映像無線局3bは、図5に示すステップS501及びS502の動作を実行し、制御無線局7からの通知に基づいて、作成した映像情報パケットを光信号に変換し、時分割多重したうえで、第1の無線通信路に送出する。端末局5は、第1の無線通信路からの光信号を受信すると、図4に示すステップS401、S402及びS409の動作を実行し、映像情報をディスプレイに表示させる。

【0061】上述したように、制御無線局7は、送信要求パケットの受信する度に、該当する映像無線局3の通信チャネルの使用状況を確認する。このとき、映像無線局3bが有する第1の通信ゾーン6b内に位置する端末局5の数が多くなり、この多数の端末局5がほぼ同時に送信要求パケットを制御無線局7に送出したとする。この場合、制御無線局7は、図8に示すステップS601、S603、S604、S801、S802、S805及びS606の処理を繰り返し実行することとなり、通信チャネル情報格納部71が保持する映像無線局3bの空きチャネル数は小さくなってしまい、やがて「0」になる。制御部41は、ステップS801において、映像無線局3bが現在空きチャネルを有するか否かを判断する。このとき、検出した空きチャネル数が「0」を示し

ていれば、制御部41は、映像無線局3bが端末局5からの映像要求を応えることができないと判断して、ステップS803に移行する。次に、制御部41は、ステップS604の動作により現在保持している端末局のIDを有する端末局5に、当該端末局5の送信要求パケットを受け付けることができない旨を通知するため、この旨と当該端末局のIDとを含む制御情報を作成する。この制御情報は、制御情報送信部142から第2の無線通信路に送出される(ステップS803)。この制御情報を受信した端末局5は、送信要求パケットを受け付けることができない旨をディスプレイ(図示せず)に表示するなどして、この旨をユーザに通知する。なお、このときの端末局5の処理は、簡単にできるため、その説明を省略する。

【0062】一方、映像情報パケットを現在受信し、映像表示中である端末局5は、第1の通信ゾーン6bから出ると、図4に示すステップS401、S410及びS411の動作を実行し、コマンドパケット(図2(c)参照)が第2の無線通信路を介して制御無線局7に送信される。このコマンドパケットを受信した制御無線局7は、図8に示すステップS601、S603、S607及びS608の処理を実行し、映像無線局3bに映像情報パケットの送出を中断するよう通知する。これによって、映像無線局3bは、この通知に対応する映像情報パケットの送出を停止し、当該映像情報パケットを送出するために用いていた通信チャネルを解放する。制御部41は、ステップS608の後S804の動作を実行し、コマンドパケットの映像無線局ID部2230から映像無線局3bのIDを取り出す。次に、制御部41は、通信チャネル情報格納部71を検索して、取り出した映像無線局のIDにより特定される映像無線局3bの空きチャネル数を検出し、空きチャネル数を「(検出した空きチャネル数)+1」に更新する(ステップS804)。

【0063】次に、本発明の第3の実施形態に係る無線映像通信システムについて説明する。本無線映像通信システムは、第2の実施形態に係る無線映像通信システムと比較して、制御無線局7と内部構成が異なる制御無線局9を備える点と、制御無線局9が「映像情報のタイトル」ではなく「メニュー情報」を送信する点とが異なる。そのため、本システムの全体構成の図示を省略し、さらに、この相違点以外の構成については、第2の実施形態において相当する部分と同一の参照番号を付し、この相違点以外の説明を簡素化する。

【0064】図9は、上述した制御無線局9の構成を示すブロック図である。図9において、制御無線局9の構成は、図7に示す制御無線局7の構成と比較すると、メニュー格納部91をさらに含む点のみが異なる。それ以外の構成については同様であるため、相当する構成については同一の参照番号を付すこととする。メニュー格納部91は、ビデオサーバ1がネットワーク2に格納して

いる映像情報のタイトルを、各映像無線局3が送信可能な毎に分類して格納し、さらに、客体探るに対応して設定される識別番号を格納する。

【0065】図10は、図9に示す制御無線局9から送信されるメニュー情報パケットのフレームフォーマットの構成を示す図である。メニュー情報パケットは、端末局ID部2236と、送信メニュー数部2237と、メニューテキスト部2238と、メニュー識別番号部2239と、映像無線局ID部2240とを含む。端末局ID部2236には、メニュー情報パケットを要求した端末局5のIDが格納される。送信メニュー数部2237には、メニュー情報パケットに格納されるメニューテキスト部2238の数が格納される。メニューテキスト部2238には、各映像無線局3が送信可能な映像情報のタイトルが格納される。メニュー識別番号部2239には、メニューテキスト部2238に格納される各映像情報のタイトルを特定するための識別番号が格納される。映像無線局ID部2240には、上記タイトルにかかる映像情報を送信可能な映像無線局3のIDが格納される。

【0066】図11は、本実施形態に係る端末局5の動作を示すフローチャートである。図11において、端末局5が実行する動作は、図4に示した端末局5の動作と比較して、ステップS1101～1105をさらに含む点で異なる。それ以外の動作については、図4に示した動作と同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。図12は、図9に示す制御無線局9の動作を示すフローチャートである。図12において、制御無線局9の動作は、図8に示した制御無線局7の動作と比較して、ステップS1201～S1204をさらに含む点で異なる。それ以外のステップについては同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。

【0067】以下、従前の実施形態と同様に、端末局5が図3に示す移動経路を辿った際の、本システムの動作について説明する。まず、本システムの初期状態において、通信チャネル情報格納部71は、各映像無線局3が有している通信チャネルの数を、それぞれにおける空き通信チャネルの数として保持する。

【0068】端末局5は、第1の通信ゾーン6bに進入すると、映像無線局3bからの光信号を受信し、電気信号に変換する。制御部54は、この電気信号を入力し(図11；ステップS401)、当該電気信号が自局宛の映像情報パケットか否かを判断する(ステップS402)。制御部54は、映像情報パケット内に他の端末局のIDが格納されていることから、ステップS1101に移行する。次に、制御部54は、ディスプレイ(図示せず)の制御状態などに基づいて、メニュー(メニュー情報パケットのメニューリスト部の内容)がディスプ

レイに表示されているか否かを判断する(ステップS101)。現時点では、メニューがディスプレイに表示されていないため、制御部54はステップS102に移行する。次に、制御部54は、内部のメモリ(図示せず)に格納されているフラグ(第1の実施形態における「フラグ」と同様のもの)を参照して、メニューを既に要求したか否かを判断する(ステップS1202)。フラグは、メニューを要求していないことを現在示しているため、制御部54は、ステップS405に移行し、映像情報パケットの中から映像無線局3bのIDを取り出す(ステップS405)。この後、制御部54は、メニュー要求パケット(図2(d))と同様のフレームフォーマットを有する)を作成する。なお、メニュー要求パケットの各部に格納される識別コードやIDは、第1の実施形態においてタイトル要求パケットに格納されるものと同様であるため、その説明を省略する。ただし、タイトル要求部2235には「メニュー要求」が格納される。この後、制御部54は、上述のフラグを、メニューを要求したことを示すように設定する。メニュー要求パケットは、制御情報送信部53から第2の無線通信路を介して制御無線局9に送られる。このようにして、端末局5は、制御無線局9に対して、メニューを要求する(ステップS103)。

【0069】制御無線局9の制御情報受信部43は、第2の無線通信路からの信号を受信し、制御部41に出力する。制御部41は、この信号を入力すると、メニュー情報格納部91にメニュー情報が格納されているか否かを検索する(図12;ステップS1201)。制御部41は、メニュー情報格納部91がメニュー情報を格納していると判断したとき、ステップS1203に移行し、入力信号であるパケットの識別コード部を解析することにより、タイトル要求パケットであるか否かを判断する(ステップS1203)。このパケットの識別コード部には第3の識別コードが格納されているため、制御部41はメニュー要求パケットであると判断し、ステップS1204に移行する。次に、制御部41は、メニュー要求パケットの端末局ID部2233及び映像無線局ID部2234から、端末局5のID及び映像無線局3bのIDを取り出す。制御部41は、メニュー情報格納部91の中から、映像無線局3bが送信可能な映像情報のタイトル及びこれを特定するための識別番号を取り出し、メニュー情報パケットを作成する。このメニュー情報パケットにおいて、端末局ID部2236には、現在メニュー情報を要求している端末局5のIDが格納される。送信メニュー部2237には、メニューテキスト部2238の数が格納される。つまり、現在作成されるメニューテキスト部は1つであるため、送信メニュー部2237には、「1」が格納される。メニューテキスト部2238には、第1の通信ゾーン6b内で受信可能な映像情報のタイトル、つまりメニューが格納される。メニ

ュー識別番号部2239には、各映像情報のタイトルを特定するための識別番号が格納される。映像無線局ID部2240には、映像無線局3bのIDが格納される。このようにして作成されたメニュー情報パケットは、制御情報送信部42により、第2の無線通信路を介して、端末局5に送信される(ステップS1204)。

【0070】端末局5の制御部54は、制御情報受信部52が受信した信号を入力すると(図11;ステップS401)、ステップS402(第1の実施形態参照)の動作を実行し、受信信号が映像情報パケットではないと判断して、ステップS1101に移行する。制御部54は、前述したステップS403及びS404と同様の動作である、ステップS1101及びS1102の動作を実行する。つまり、制御部54は、現在メニューを表示していないと判断し(ステップS1101)、既にメニュー情報を要求したと判断して(ステップS1102)、ステップS1104に移行する。これによって、制御部54は、入力信号をメニュー情報パケットと判断し、このパケットに含まれるメニューをディスプレイに表示させる(ステップS1104)。端末局5のユーザは、入力操作器(図示せず)を操作して、ディスプレイに表示された映像情報のタイトルの中から、視聴したい映像情報のタイトルを選択する。入力操作器は、ユーザの操作に応答して、選択された映像情報のタイトルを示す信号を制御部54に出力する。制御部54は、入力操作器からの信号を入力する(ステップS401)。前述より明らかのように、制御部54は、この入力信号を映像情報パケットではないと判断した後(ステップS402)、現在タイトルを表示していると判断するため(ステップS403)、ステップS408に移行する。これによって、制御部54は、入力信号が映像情報のタイトルを示す信号であると判断し、映像要求パケット(図2(b)参照)を作成し、送信する(ステップS408)。この映像要求パケットにおいて、映像無線局ID部2226には映像無線局3bのIDが格納され、要求映像部2227にはユーザによって選択された映像情報のタイトルに対応する識別番号が格納される。他の部分2224及び2225については、前述したとおりであるため、それらの説明を省略する。この映像要求パケットは、制御情報送信部53から第2の無線通信路を介して制御無線局9に送られる。

【0071】制御無線局9の制御情報受信部43は、第2の無線通信路からパケットを受信し、制御部41に出力する。制御部41は、メニュー情報がメニュー情報格納部91に格納されていることを確認した後(図12;ステップS1201)、このパケットがメニュー要求パケットではないと判断する(ステップS1203)。次に、制御部41は、入力したパケットが映像要求パケットであるか否かを判断する(ステップS603)。制御部41は、このパケットの識別コード部には第1の識別

コードが格納されていることから、当該パケットを映像要求パケットと判断する。次に、制御部41は、映像要求パケットの端末局ID部2225、映像無線局ID部2226及び要求映像部2227に格納されている端末局のID、映像無線局3bのID及び映像情報のタイトルを特定するための識別番号を取り出す(ステップS604)。次に、制御部41は、第2の実施形態において詳説したステップS801及びS802の動作を実行し、映像無線局3bが空きチャネルを有している場合のみ、ニュー情報格納部91で管理している共有ファイルのファイル名(映像情報のタイトル)の中から、ステップS604の処理で取り出した識別番号に対応するファイル名を取り出す(ステップS605)。次に、制御部41は、ステップS604の処理で取り出した端末局及び映像無線局3bのIDと、ステップS605の処理で取り出したファイル名とを、制御情報送信部42に出力する。制御情報送信部42は、端末局及び映像無線局3bのIDとファイル名とを、ネットワーク2に出力する(ステップS606)。

【0072】映像無線局3bは、ネットワーク2からの信号を受信すると、第1の実施形態において詳説したのと同様に、図5に示すステップS501及びS502の動作を実行して映像情報パケット(図2(a)参照)を作成する。映像情報送信部32は、この映像情報パケットを光信号に変換し時分割多重化して、端末局5に第1の無線通信路を用いて送信する。端末局5は、前述したように、第1の無線通信路からの光信号を受信すると、第1の実施形態において詳説したのと同様に、図1に示すステップS401、S402及びS409の動作を実行して映像情報を、ディスプレイに表示させる。これによって、端末局5のユーザは、選択した映像情報を視聴することができる。

【0073】その後、端末局5は、映像表示中に、第1の通信ゾーン6bから、第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと離脱した。この場合、端末局5は、第1の実施形態において詳説したのと同様に、ステップS401、S410及びS411の動作を実行し、コマンドパケット(図2(c)参照)を作成する。制御情報送信部53は、このコマンドパケットを第2の無線通信路に送出する。

【0074】制御無線局9の制御情報受信部43は、第2の無線通信路からパケットを受信し、制御部41に出力する。制御部41は、メニュー情報がメニュー情報格納部91に格納されていることを確認した後(図12；ステップS1201)、このパケットには、第2の識別コードが格納されていることから、メニュー要求パケット及び映像要求パケットではないと判断する(ステップS1203、S603)。次に、制御部41は、ステップS607に移行し、このパケットがコマンドパケットであると判断する。次に、制御部41は、第2の実施形

態において詳説したのと同様に、ステップS608及びS804の動作を実行して、映像無線局3bに対して映像情報パケットの中止通知をする。映像無線局3bは、第1の実施形態において詳説したのと同様に、ステップS501及びS503の処理を実行し、制御無線局9からの中断通知の応答して、端末局5向けの共有ファイルの読み出しを中断し、クローズする。これに伴い、映像情報送信部32は、映像情報パケットの作成を停止する。

10 【0075】次に、端末局5は、映像非表示中に、第1の通信ゾーン6bから第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと映像を表示していない時に離脱した。この場合、端末局5は、光信号を受信不可能となることにより、入力信号がないと判断し(ステップS401)、ステップS410に移行する。その後、制御部54は、映像情報がディスプレイに表示中でないため、ディスプレイに現在表示中であるメニューの表示を終了させる(ステップS1105)。

20 【0076】次に、本発明の第4の実施形態に係る無線映像通信システムについて説明する。本無線映像通信システムは、第3の実施形態に係る無線映像通信システムと比較して、制御無線局9と内部構成が相違する制御無線局13を備える点のみが異なる。そのため、本システムの全体構成の図示を省略し、さらに、この相違点以外の構成については、第3の実施形態において相当する部分と同一の参照番号を付し、この相違点以外の説明を簡素化する。図13は、上述した制御無線局13の構成を示すブロック図である。図13において、制御無線局13は、図9に示す制御無線局9と比較して、位置情報格納部131をさらに含む点のみが異なる。それ以外は同様であるため、相当する構成については同一の参照番号を付すこととする。位置情報格納部131は、メニュー要求とともに送られてくる端末局5のIDを用いて、当該端末局5の現在位置に関する情報を格納する。

30 【0077】図14は、本実施形態に係る端末局5の動作を示すフローチャートである。図14において、端末局5が実行する動作は、図11に示した端末局5の動作と比較して、ステップS1401をさらに含む点で異なる。それ以外の動作については、図11に示した動作と同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。図15は、図13に示す制御無線局13の動作を示すフローチャートである。図15において、制御無線局13の動作は、図12に示した制御無線局9の動作と比較して、ステップS1501及びS1502をさらに含む点で異なる。それ以外のステップについては同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。

40 【0078】以下、従前の実施形態と同様に、端末局5

が図3に示す移動経路を辿った際の、本システムの動作について説明する。まず、本システムの初期状態において、通信チャネル情報格納部71は、各映像無線局3が有している通信チャネルの数を、それそれにおける空き通信チャネルの数として保持する。

【0079】端末局5は、第1の通信ゾーン6bに進入すると、まず、メニュー情報を制御無線局1501に要求する(図14;ステップS401、S402、S1101、S1102、S405及びS1103)。この要件に応答して、制御無線局13は、メニュー情報に基づいて作成したメニュー情報パケットを、第2の無線通信路を用いて端末局5に送信する(図15;ステップS1201、S1203及びS1204)。なお、制御無線局13は、メニュー情報がメニュー情報格納部91に格納されていない場合には、メニュー情報を作成した後(ステップS1202)、メニュー情報パケットを送信する。次に、制御部41は、メニュー情報の要求とともに送られてくる端末局5及び映像無線局13bのIDを位置情報格納部131に格納する(ステップS1501)。これによって、端末局5が現在位置している第1の通信ゾーン6は映像無線局3bが有するゾーンであることを、制御無線局13は認識する。

【0080】端末局5は、制御無線局13から送られてくるメニュー情報パケットに基づいて、メニュー情報をディスプレイに表示させる(図14;S401、S402、S1101、S1102及びS1104)。その後、端末局5は、映像無線局13b向けの映像要求パケットを、第2の無線通信路を介して制御無線局13に送信する(図14;ステップS401、S402、S1101及びS408)。制御無線局13の制御部41は、図15に示すステップS1201、S1203、S603及びS604の動作を実行することにより、第2の無線通信路からの入力信号を、映像要求パケットと判断し、さらに、映像要求パケットの端末局ID部2225、映像無線局ID部2226及び要求映像部2227に格納されている端末局のID、映像無線局3bのID及び映像情報のタイトルを取り出して保持する。次に、制御部41は、ステップS604で取り出した映像無線局のIDにより特定される映像無線局3bの空きチャネル数を検出する。制御部41は、検出した空きチャネル数に基づいて、映像無線局3bが現在空きチャネルを有していると判断すれば(ステップS801)、第2の実施形態と同様にして、通信チャネル情報格納部71が現在格納する映像無線局3bの空きチャネル数を更新する(ステップS802)。次に、制御部41は、ステップS605及びS606の処理を実行し、端末局のID、映像無線局3bのID及びファイル名を、ネットワーク2に出力する。なお、制御部41は、ステップS801の動作において、検出した空きチャネル数が「0」を示していれば、ステップS803の動作を実行するのは、

第2の実施形態と同様である。

【0081】ネットワーク2からの信号を受信するのは、前述したように、映像無線局3bのみである。映像無線局3bは、図5に示すステップS501及びS502の処理を実行し、制御無線局13からの通知に基づいて、作成した映像情報パケット2を光信号に変換し、時分割多重したうえで、第1の無線通信路に送出する。端末局5は、第1の無線通信路から光信号を受信すると、図14に示すステップS401、S402及びS409の動作を実行し、映像情報をディスプレイに表示させる。

【0082】その後、端末局5は、映像表示中に、第1の通信ゾーン6bから、第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと離脱した。端末局5は、上記のような場所に出ると、前述と同様に、図14に示すステップS401、ステップS410及びS411の動作を実行し、コマンドパケットを第2の無線通信路を用いて制御無線局13に送信する。制御無線局13は、図15に示すステップS1201、S1203、S603、S607、S608及びS804を実行し、映像無線局3bに中断通知を送るとともに、通信チャネル情報を更新する。この後、制御部41は、コマンドパケットの端末局ID部2229に格納されている端末局のIDを参照して、ステップS1501の動作時に位置情報格納部131に格納した映像無線局3bのIDを削除などし、位置情報を更新する(ステップS1502)。これによって、制御部41は、端末局5が第1の通信ゾーン6bから離脱し、現在いずれの第1の通信ゾーン6にも位置していないことを認識することができる。

【0083】次に、端末局5は、映像非表示中に、第1の通信ゾーン6bから第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと映像を表示していないときに離脱した。端末局5は、上記のような場所に出ると、図14に示すステップS401、S410及びS1105の動作を実行し、ディスプレイに表示中であるメニュー情報を消去する。その後、端末局5の制御部54は、図2(c)に示すコマンドパケットを作成し、第2の無線通信路を用いて制御無線局13に送信する。ただし、このコマンドパケットのコマンド部2231には、前述した「中断命令」ではなく、位置情報格納部131に格納されている位置情報を更新する旨が格納される。制御無線局13は、上述したステップS1702と同様の動作を実行することにより、ステップS1501の動作時に位置情報格納部131に格納した映像無線局3bのIDを削除などし、位置情報を更新する。

【0084】次に、本発明の第5の実施形態に係る無線映像通信システムについて説明する。本無線映像通信システムは、第4の実施形態に係る無線映像通信システム

と比較して、制御無線局13と内部構成が相違する制御無線局16を備える点のみが異なる。そのため、本システムの全体構成の図示を省略し、さらに、この相違点以外の構成については、第4の実施形態において相当する部分と同一の参照番号を付し、この相違点以外の説明を簡素化する。図16は、上述した制御無線局16の構成を示すブロック図である。図16において、制御無線局16は、図13に示す制御無線局16と比較して、位置履歴情報格納部161をさらに含む点のみが異なる。それ以外は同様であるため、相当する構成については同一の参照番号を付すこととする。位置履歴情報格納部161は、位置情報格納部131に格納される情報を用いて、端末局5が現在に至るまでの経路に関する情報の履歴、つまり位置履歴情報を格納する。

【0085】図17は、図16に示す制御無線局16の動作を示すフローチャートである。図17において、制御無線局16の動作は、図17に示した制御無線局16の動作と比較して、ステップS1701をさらに含む点と、図17に示すステップS1502の動作を実行しない点とで異なる。それ以外のステップについては同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。なお、本実施形態に係る映像無線局3及び端末局5は、図5及び図14に示した動作を実行する。そのため、映像無線局3及び端末局5の動作については、図11及び図14を参照し、簡素化して説明する。

【0086】以下、従前の実施形態と同様に、端末局5が図3に示す移動経路を辿った際の、本システムの動作について説明する。まず、本システムの初期状態において、通信チャネル情報格納部71は、各映像無線局3が有している通信チャネルの数を、それぞれにおける空き通信チャネルの数として保持する。

【0087】端末局5は、第1の通信ゾーン6bに進入すると、まず、メニュー情報を制御無線局1501に要求する(図14;ステップS401、S402、S1101、S1102、S405及びS1103)。

【0088】この要求に応答して、制御無線局16は、メニュー情報に基づいて作成したメニュー情報パケットを、第2の無線通信路を用いて端末局5に送信する(図17;ステップS1201、S1203及びS1204)。なお、制御無線局16は、メニュー情報がメニュー情報格納部91に格納されていない場合には、メニュー情報を作成した後(ステップS1202)、メニュー情報パケットを送信する。次に、制御部41は、位置情報格納部131に現在格納されている映像無線局3のIDを取り出し、位置履歴情報格納部161において、当該端末局5の位置履歴情報が格納されている領域に、前回位置していた第1の通信ゾーン6として当該IDを格納する(ステップS1701)。次に、制御部41は、メニュー情報の要求とともに送られてくる端末局5及び

映像無線局13bのIDを位置情報格納部131に格納する(ステップS1501)。

【0089】端末局5は、制御無線局16から送られてくるメニュー情報パケットに基づいて、メニューをディスプレイに表示させる(図14;S401、S402、S1101、S1102及びS1104)。その後、端末局5は、映像無線局13b向けの映像要求パケットを、第2の無線通信路を介して制御無線局16に送信する(図14;ステップS401、S402、S1101及びS408)。制御無線局16の制御部41は、図17に示すステップS1201、S1203、S603及びS604の動作を実行することにより、第2の無線通信路からの入力信号を、映像要求パケットと判断し、さらに、映像要求パケットの端末局ID部2225、映像無線局ID部2226及び要求映像部2227に格納されている端末局のID、映像無線局3bのID及び映像情報のタイトルを取り出して保持する。次に、制御部41は、ステップS801及びS802の動作を実行することにより、映像無線局3bが空きチャネルを有している場合にのみ、ステップS605及びS606の動作を実行し、端末局のID、映像無線局3bのID及びファイル名を、ネットワーク2に出力する。なお、制御部41は、ステップS801の動作において、検出した空きチャネル数が「0」を示していれば、ステップS803の動作を実行するのは、第2の実施形態と同様である。

【0090】ネットワーク2からの信号を受信するのは、前述したように、映像無線局3bのみである。映像無線局3bは、図5に示すステップS501及びS502の処理を実行し、制御無線局16からの通知に基づいて、作成した映像情報パケット2を光信号に変換し、時分割多重したうえで、第1の無線通信路に送出する。端末局5は、第1の無線通信路から光信号を受信すると、図14に示すステップS401、S402及びS409の動作を実行し、映像情報をディスプレイに表示させる。

【0091】その後、端末局5は、映像表示中に、第1の通信ゾーン6bから、第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと離脱した。端末局5は、上記のような場所に出ると、前述と同様に、図14に示すステップS401、ステップS410及びS411の動作を実行し、コマンドパケットを第2の無線通信路を用いて制御無線局16に送信する。制御無線局16は、図17に示すステップS1201、S1203、S603、S607、S608及びS804を実行し、映像無線局3bに中断通知を送るとともに、通信チャネル情報を更新する。なお、制御無線局16は、次回のステップS1701の動作において映像無線局3のIDを位置履歴情報格納部161に格納できるようにするため、第4の実施形態のようなステップS1502(図15参照)と同様の動作を実行せず、その

まま位置情報格納部131に映像無線局3bのIDを格納しておく。

【0092】次に、端末局5は、映像非表示中に、第1の通信ゾーン6bから第2の通信ゾーン7内であって、かつどの第1の通信ゾーン6にも属しない場所へと映像を表示していないときに出た。端末局5は、上記のような場所に出ると、図14に示すステップS401、S410及びS1105の動作を実行し、ディスプレイに表示中であるメニュー情報を消去する。その後、端末局5の制御部54は、図2(c)に示すコマンドパケットを作成し、第2の無線通信路を用いて制御無線局16に送信する。ただし、このコマンドパケットのコマンド部2231には、前述した「中断命令」ではなく、位置情報格納部131に格納されている位置情報を更新する旨が格納される。なお、制御無線局16は、次のステップS1701の動作において映像無線局3のIDを位置履歴情報格納部161に格納できるようにするため、第4の実施形態のようにステップS1502(図15参照)と同様の動作を実行しない。

【0093】次に、本発明の第6の実施形態に係る無線映像通信システムについて説明する。本無線映像通信システムは、第5の実施形態に係る無線映像通信システムと比較して、制御無線局16と内部構成が相違する制御無線局18を備える点のみが異なる。そのため、本システムの全体構成の図示を省略し、さらに、この相違点以外の構成については、第5の実施形態において相当する部分と同一の参照番号を付し、この相違点以外の説明を簡素化する。図18は、上述した制御無線局18の構成を示すブロック図である。図18において、制御無線局18は、図16に示す制御無線局16と比較して、ゾーンマップ格納部181をさらに含む点のみが異なる。それ以外は同様であるため、相当する構成については同一の参照番号を付すこととする。ゾーンマップ格納部181は、各第1の通信ゾーン6及びそれそれに隣接する第1の通信ゾーン6を、映像無線局3の映像無線局IDを用いて管理する。

【0094】図19は、図18に示す制御無線局18の動作を示すフローチャートである。図19において、制御無線局18の動作は、図17に示した制御無線局16の動作と比較して、ステップS1901をさらに含む点で異なる。図20は、本実施形態に係る端末局5の動作を示すフローチャートである。図20において、端末局5は、図14に示した端末局5の動作と比較して、ステップS2001、S2002の動作をさらに実行する点、及び、ステップS405の動作を実行しない点で異なる。それ以外のステップについては同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。なお、本実施形態に係る映像無線局3は、図5に示した動作を実行するためその動作については簡素化して説明する。

【0095】以下、従前の実施形態と同様に、端末局5が図3に示す移動経路を辿った際の、本システムの動作について説明する。まず、本システムの初期状態において、通信チャネル情報格納部71は、各映像無線局3が有している通信チャネルの数を、それぞれにおける空き通信チャネルの数として保持する。また、端末局5は、制御無線局18から前回送られてきたメニュー情報パケットを内部のメモリ(図示せず)に格納している。

【0096】端末局5は、第1の通信ゾーン6bに進入すると、メニューがディスプレイに表示されているか否かを判断する(ステップS401、S402及びS1101)。端末局5の制御部54は、現時点では、メニューが表示されていないと判断するため、ステップS2001に移行する。制御部54は、現在内部に保持しているメニュー情報パケットの映像無線局ID部2240に、ステップS401において他の端末局向けの映像情報パケットを受信したときに、当該映像情報パケットから取り出して保持している映像無線局3bのIDがあるか否かを検出する。制御部54は、メモリに保持しているメニュー情報パケットの中に、映像無線局3bのIDを検出すると、現在必要なメニューを保持していると判断する(ステップS2001)。この場合、制御部54は、メモリに保持しているメニュー情報パケットの中から、現在必要なメニューを取り出し、これをディスプレイに表示させる(ステップS1104)。これによって、端末局5は、映像要求パケットを送信することができる。

【0097】一方、制御部54は、ステップS2001において、現在必要なメニューを保持していないと判断した場合、ステップS1102及びS1103の動作を実行し、制御無線局18に対してメニューを要求する。この要求に応答して、制御無線局16は、メニュー情報に基づいて作成したメニュー情報パケットを、第2の無線通信路を用いて端末局5に送信する(図15:ステップS1201、S1203、S1901及びS1204)。このとき、制御無線局16は、メニュー情報の要求とともに送られてくる映像無線局3bのIDを参照して、ゾーンマップ格納部181に格納されているメニュー情報の中から、映像無線局3bと、第1の通信ゾーン6bに隣接する通信ゾーンを有する映像無線局3とのメニュー情報とを作成し、これに基づいてメニュー情報パケットを作成して送信する(ステップS1901)。したがって、このメニュー情報パケットは、図10に示すフォーマットを有するが、メニュー・テキスト部2238、メニュー識別番号部2239及び映像無線局ID部2240は、映像無線局3bと、第1の通信ゾーン6bに隣接する通信ゾーンを有する映像無線局3との分だけ存在する。そのため、送信メニュー数部2237には、この映像無線局3の数が格納される。この後、制御部41は、(ステップS1701及びS1501)の動作を実

行するのは、第5の実施形態において詳説したとおりである。

【0098】端末局5は、制御無線局16から送られてくるメニュー情報パケットに基づいて、メニュー情報をディスプレイに表示させる(図20; S401、S402、S1101、S2001及びS1104)。これによって、端末局5は、映像要求パケットを送信することができる。さらに、制御部54は、制御無線局16から送信されてきたメニュー情報パケットを内部のメモリに格納しておく。

【0099】次に、本発明の第7の実施形態に係る無線映像通信システムについて説明する。本無線映像通信システムは、第6の実施形態に係る無線映像通信システムと比較して、制御無線局18と内部構成が相違する制御無線局21を備える点のみが異なる。そのため、本システムの全体構成の図示を省略し、さらに、この相違点以外の構成については、第6の実施形態において相当する部分と同一の参照番号を付し、この相違点以外の説明を簡素化する。図21は、上述した制御無線局21の構成を示すブロック図である。図21において、制御無線局21は、図18に示す制御無線局18と比較して、映像履歴情報格納部211をさらに含む点のみが異なる。それ以外は同様であるため、相当する構成については同一の参照番号を付すこととする。映像履歴情報格納部211は、各端末局5が映像無線局3から受信した映像情報を、端末局毎に分けて格納する。

【0100】図22は、図21に示す制御無線局21の動作を示すフローチャートである。図22において、制御無線局21の動作は、図19に示した制御無線局18の動作と比較して、ステップS2201をさらに含む点で異なる。それ以外のステップについては同様であるため、相当するステップには同一のステップ番号を付し、その説明を省略する。なお、本実施形態に係る映像無線局3及び端末局5は、図5及び図20に示した動作を実行するため、それぞれ動作についての説明は簡素化する。

【0101】制御無線局21は、端末局5からの映像要求パケットを受信すると、第6の実施形態などと同様に、映像無線局3bに端末局ID及びファイル名を通知するため、図22に示すステップS1201、S1203、S603、S604、S801、S802、S605の動作を実行する。この後、制御無線局21の制御部41は、映像要求パケットの要求映像部2227に格納されている映像情報のタイトルを取り出し、映像履歴情報格納部211において、この端末局5の映像履歴情報が格納されている領域に、取り出した映像情報をタイトルを格納する(ステップS2201)。この後、制御部41は、ステップS606の動作を実行し、映像無線局3bに端末局ID及びファイル名を通知する。

【0102】次に、本発明の第8の実施形態に係る無線

映像通信システムについて説明する。本無線映像通信システムは、第7の実施形態に係る無線映像通信システムと比較して、映像無線局3と内部構成が相違する映像無線局23を備える点のみが異なる。そのため、本システムの全体構成の図示を省略し、さらに、この相違点以外の構成については、第7の実施形態において相当する部分と同一の参照番号を付し、この相違点以外の説明を簡素化する。図23は、上述した映像無線局23の構成を示すブロック図である。図23において、映像無線局23は、図1に示す制御無線局3と比較して、映像キャッシュ部231をさらに含む点のみが異なる。それ以外は同様であるため、相当する構成については同一の参照番号を付すこととする。映像キャッシュ部231は、高速アクセス可能な記憶素子又は記録装置で構成されており、映像情報である共有ファイルの一部を格納する。

【0103】図24は、図23に示す映像無線局23の動作を示すフローチャートである。図24において、映像無線局23の動作は、図5に示した映像無線局3の動作と比較して、ステップS2401～S2411をさらに実行する点と、(ステップS502の動作を実行しない点)で異なる。それ以外のステップについては同様であるため、相当するステップには同一のステップ番号を付し、その説明を省略する。また、本実施形態に係る制御無線局21及び端末局5は、図21及び図14に示した動作を実行する。そのため、映像無線局21及び端末局5の動作については省略する。

【0104】映像無線局23は、制御無線局21から通知される端末局及び映像無線局のIDとファイル名とを、ネットワーク2を介して受信すると、従前の実施形態と同様に、これが自局宛の通知か否かを判断する。このとき、従前の実施形態と同様に、映像無線局223bが自局宛の通知であると判断したとする。映像無線局223bは、まず、図24に示すステップS501の動作を実行して、この通知が中断指示でないと判断して、ステップS2401に移行する。次に、ファイル共有部31は、受信信号(制御無線局21からの通知)に含まれるファイル名に対応する共有ファイルをオープンする(ステップS2401)。かかるオープンは多少の時間を要するため、次に、映像キャッシュ部231は、受信信号に含まれるファイル名に対応するファイルを内部に格納しているか否か、つまり、指示された映像情報が映像キャッシュ部231にあるか否かを判断する(ステップS2402)。このとき、映像キャッシュ部231は、内部にかかるファイルを格納していないと判断すると、ステップS2403に移行する。つまり、共有ファイル部31が共有ファイルを読み出した後(ステップS2403)、これを映像情報送信部32に出力する。映像情報送信部32は、従前の実施形態と同様に映像情報パケットを作成して、端末局5に送信する(ステップS2404)。また、共有ファイル部31によって読み出

された共有ファイルの一部は、次回同一ファイルの送信が指示されたときのために、映像キャッシュ部231に格納される。

【0105】このように、映像キャッシュ部231にファイルが格納されている場合、つまり、ステップS2401の動作において、指示された映像情報が映像キャッシュ部231にあると判断された場合、映像無線局23bはステップS2405に移行する。このとき、映像無線局23bは、映像キャッシュ部231に格納され、指示されたファイルをオープンし（ステップS2405）、読み出した後（ステップS2406）、このファイルを映像情報送信部32に出力する。映像情報送信部32は、入力したファイルに基づいて、映像情報パケットを作成して、端末局5に送信する（ステップS2407）。その後、映像無線局23bは、ファイル共有部31から共有ファイルが読み出し可能になったか否かを判断する（ステップS2408）。映像無線局23bは、かかる読み出しができないと判断すると、ステップS2406～S2407の動作を繰り返し実行し、当該読み出しが可能となった時点で、映像キャッシュ部231からの読み出しを中断してステップS2403に移行する。

【0106】次に、本発明の第9の実施形態に係る無線映像通信システムについて説明する。本無線映像通信システムは、第8の実施形態に係る無線映像通信システムと比較して、映像無線局23と内部構成が相違する映像無線局25を備える点のみが異なる。そのため、本システムの全体構成の図示を省略する。また、この相違点以外は、第8の実施形態において説明した構成と同様であるため、相当する構成については同一の参照番号を付し、この相違点以外の説明を省略する。図25は、上述した映像無線局25の構成を示すブロック図である。図25において、映像無線局25は、図23に示す制御無線局23と比較して、固有映像情報格納部251をさらに含む点のみが異なる。それ以外は同様であるため、相当する構成については同一の参照番号を付すこととする。固有映像情報格納部251は、記憶素子あるいは記録装置などで構成されており、ビデオサーバ1の映像情報格納部11に格納されている全ての映像情報のうち、当該固有映像情報格納部251を含む映像無線局3のみに関連のある固有の映像情報を格納する。

【0107】図26は、図25に示す映像無線局25の動作を示すフローチャートである。図26において、映像無線局25の動作は、図24に示した映像無線局23の動作と比較して、ステップS2601～S26をさらに含む点で異なる。それ以外のステップについては同様であるため、相当するステップには同一のステップ番号を付し、その説明を簡素化する。なお、本実施形態に係る制御無線局21及び端末局5は、図21及び図14に示した動作を実行する。そのため、映像無線局21及び

端末局5の動作の説明は省略する。

【0108】映像無線局25は、制御無線局21から通知される端末局及び映像無線局のIDとファイル名とを、ネットワーク2を介して受信すると、従前の実施形態と同様に、これが自局宛の通知か否かを判断する。このとき、従前の実施形態と同様に、映像無線局25bが自局宛の通知であると判断したとする。映像無線局25bは、まず、図24に示すステップS501の動作を実行して、この通知が中断指示でないと判断して、ステップS2601に移行する。次に、映像無線局3bは、受信信号（制御無線局21からの通知）に含まれるファイル名に対応する映像情報が固有情報格納部251に格納されているか否かを判断する（ステップS2601）。このとき、固有情報格納部251は、内部にかかるファイルを格納していないと判断すると、第8の実施形態において説明したようにして、映像情報パケットを作成して送信する（ステップS2403及びS2404、ステップS2405～S2408）。このとき、共有ファイル部31によって読み出された共有ファイルが固有の映像情報である場合は、次回同一ファイルの送信が指示されたときのために、固有情報格納部251に格納される。

【0109】このように、固有映像情報格納部251に固有の映像情報が格納されている場合、つまり、ステップS2601の動作において、指示された映像情報が固有情報格納部2601にあると判断された場合、映像無線局25bはステップS2602に移行する。このとき、映像無線局25bは、固有映像情報格納部251に格納され、指示されたファイルをオープンし（ステップS2602）、読み出した後（ステップS2603）、このファイルを映像情報送信部32に出力する。映像情報送信部32は、入力したファイルに基づいて、映像情報パケットを作成して、端末局5に送信する（ステップS2604）。

【図面の簡単な説明】

【図1】本発明の第1の実施形態に係る無線映像通信システムの全体構成を示すブロック図である。

【図2】図1に示す無線映像通信システムにおいて用いられるパケットのフォーマットを示す図である。

【図3】図1に示す端末局5が、サービスエリア外からある通信ゾーン6に入ってきたときの様子（矢印A参照）、及び、ある通信ゾーン6からサービスエリア外にでていくときの様子（矢印B参照）を示す図である。

【図4】図1に示す端末局5の動作を示すフローチャートである。

【図5】図1に示す映像無線局3の動作を示すフローチャートである。

【図6】図1に示す制御無線局4の動作を示すフローチャートである。

【図7】本発明の第2の実施形態における制御無線局7

のブロック図である。

【図 8】本発明の第2の実施形態における制御無線局の動作を示すフローチャートである。

【図 9】本発明の第2の実施形態における映像無線局の動作を示すフローチャートである。

【図 10】本発明の第3の実施形態における制御無線局のブロック図である。

【図 11】本発明の第3の実施形態における映像情報パケットのフレーム構成を示す図である。

【図 12】本発明の第3の実施形態における端末局の動作を示すフローチャートである。

【図 13】本発明の第4の実施形態に係る制御無線局13の構成を示すブロック図である。

【図 14】本発明の第4の実施形態に係る端末局5の動作を示すフローチャートである。

【図 15】図13に示す制御無線局13の動作を示すフローチャートである。

【図 16】第5の実施形態に係る制御無線局16の構成を示すブロック図である。

【図 17】図16に示す制御無線局16の動作を示すフローチャートである。

【図 18】第6の実施形態に係る制御無線局18の構成を示すブロック図である。

【図 19】図18に示す制御無線局18の動作を示すフローチャートである。

【図 20】本発明の第6の実施形態に係る端末局5の動作を示すフローチャートである。

【図 21】本発明の第7の実施形態に係る制御無線局21の構成を示すブロック図である。

【図 22】図21に示す制御無線局21の動作を示すフローチャートである。

【図 23】本発明の第8の実施形態に係る映像無線局23の構成を示すブロック図である。

【図 24】図23に示す映像無線局23の動作を示すフローチャートである。

* ローチャートである。

【図 25】本発明の第9の実施形態に係る映像無線局25の構成を示すブロック図である。

【図 26】図25に示す映像無線局25の動作を示すフローチャートである。

【図 27】従来の無線映像通信システムの全体構成を示すブロック図である。

【符号の説明】

1 … ビデオサーバ

1 1 … 映像情報格納部

1 2 … ファイル共有部

2 … ネットワーク

3, 23, 25 … 映像無線局

2 3 1 … 映像キャッシュ部

2 5 1 … 固有映像情報格納部

3 1 … ファイル共有部

3 2 … 映像情報送信部

4, 7, 9, 13, 16, 18, 21 … 制御無線局

4 1 … 制御部

4 2 … 制御情報送信部

4 3 … 制御情報受信部

7 1 … 通信チャネル情報格納部

9 1 … メニュー格納部

1 3 1 … 位置情報格納部

1 6 1 … 位置履歴情報格納部

1 8 1 … ゾーンマップ格納部

2 1 1 … 映像履歴情報格納部

5 … 端末局

5 1 … 映像情報受信部

5 2 … 制御情報受信部

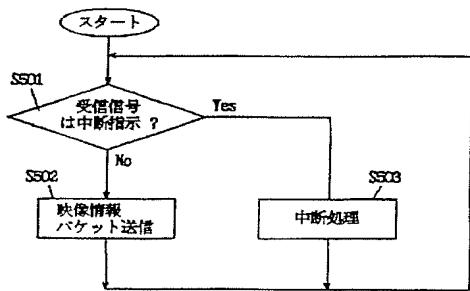
5 3 … 制御情報送信部

5 4 … 制御部

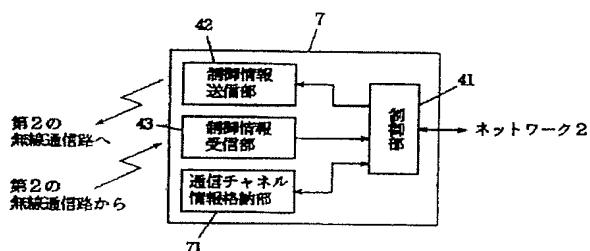
6 … 第1の通信ゾーン

7 … 第2の通信ゾーン

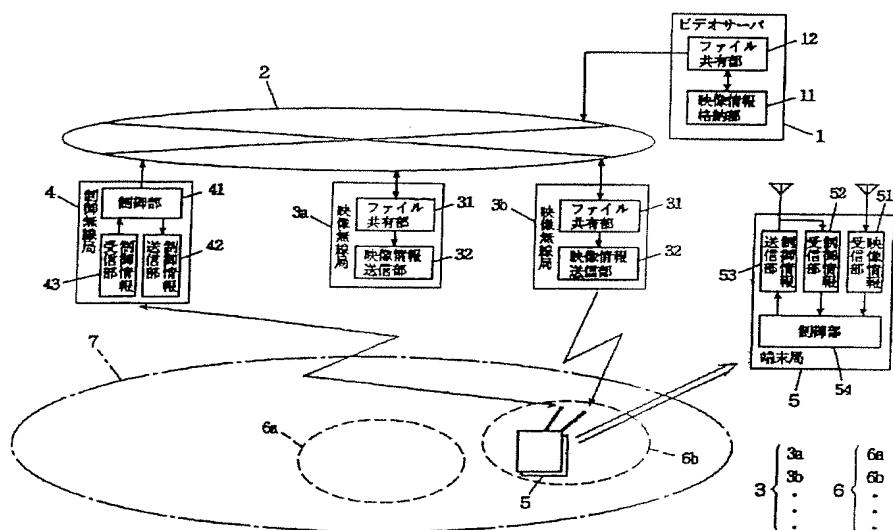
【図 5】



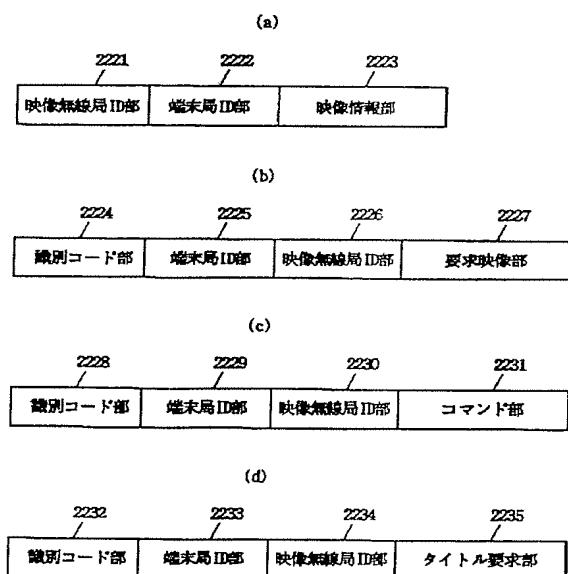
【図 7】



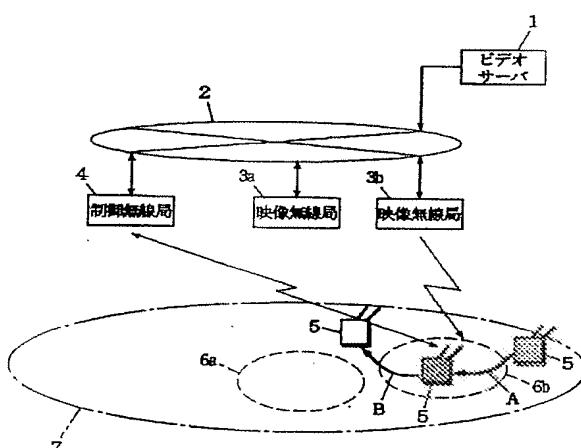
【図1】



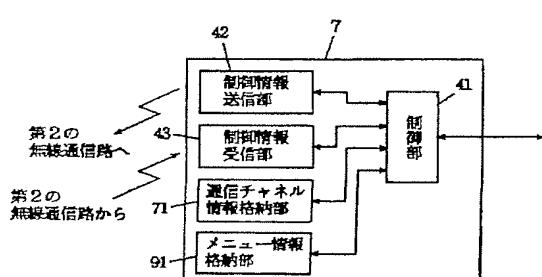
【図2】



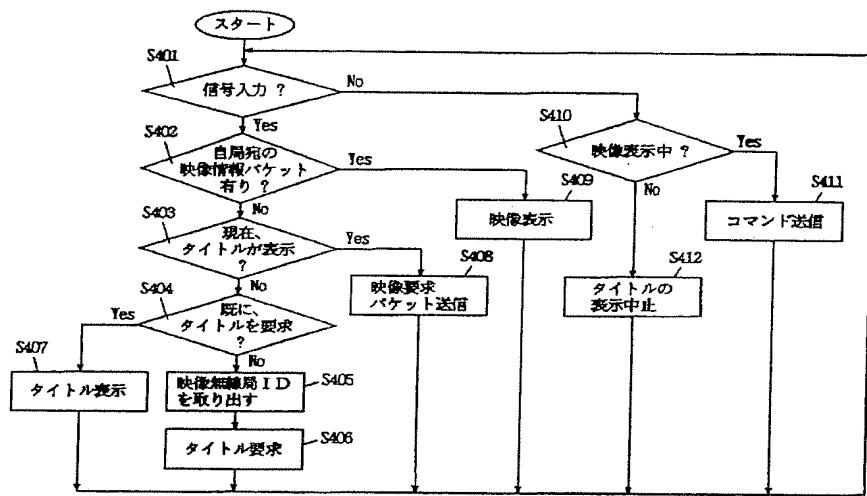
【図3】



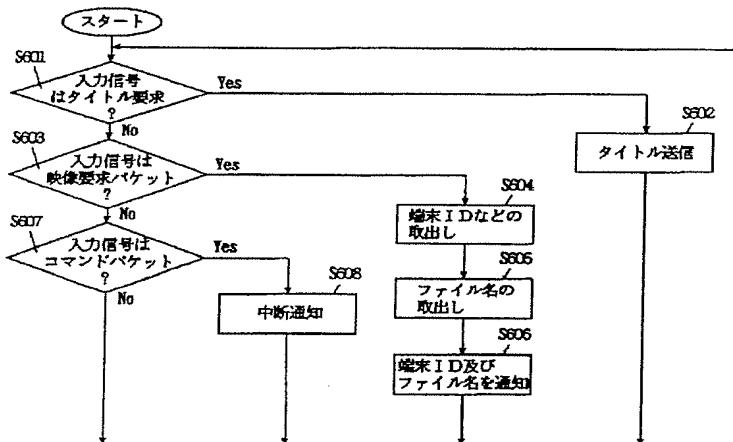
【図9】



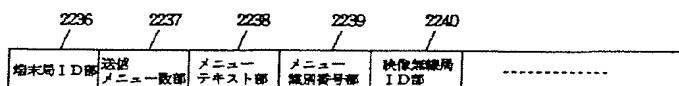
【図4】



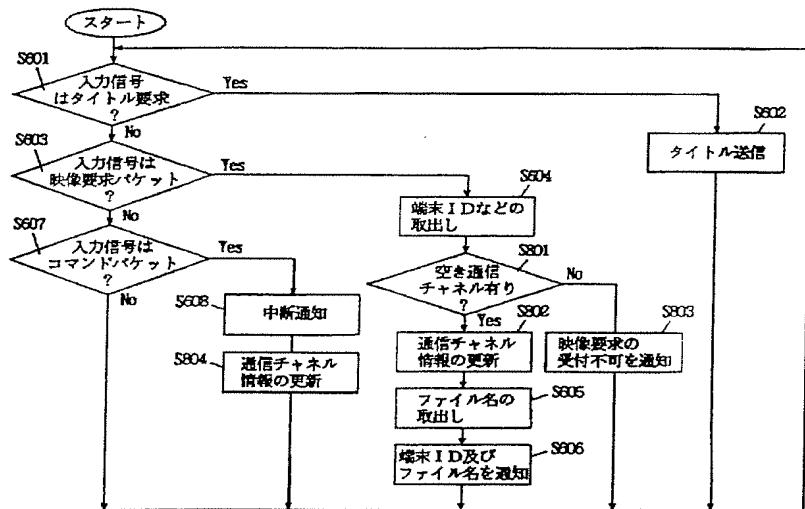
【図6】



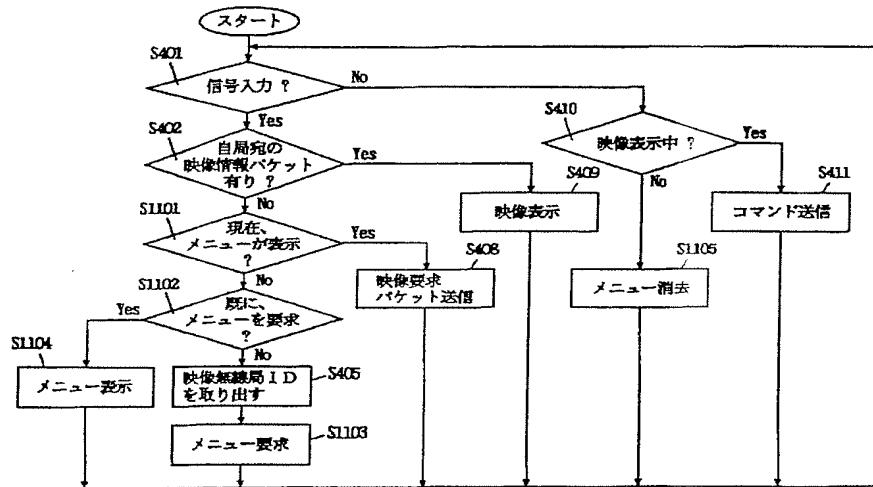
【図10】



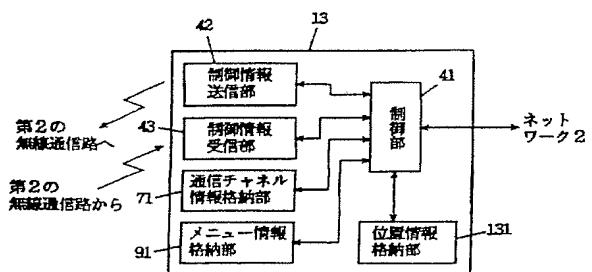
【図8】



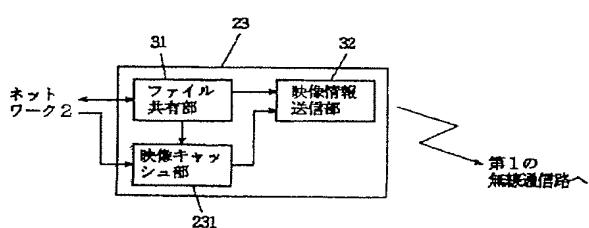
【図11】



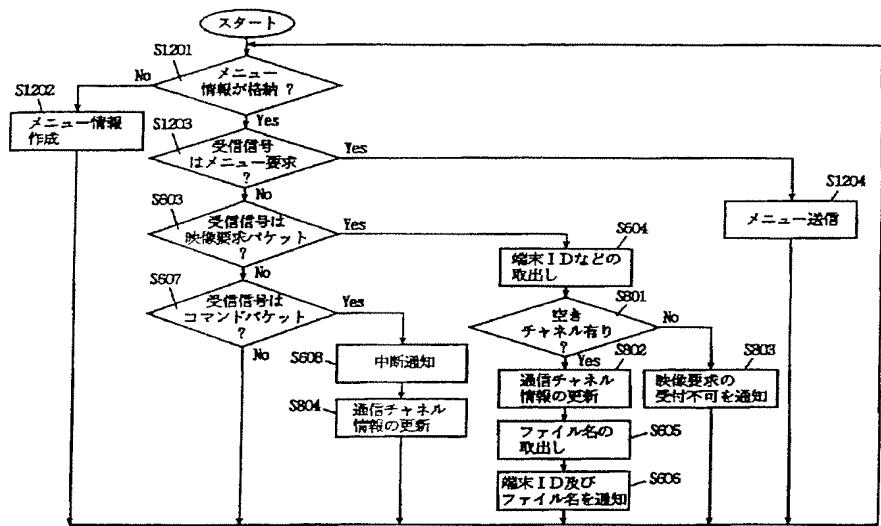
【図13】



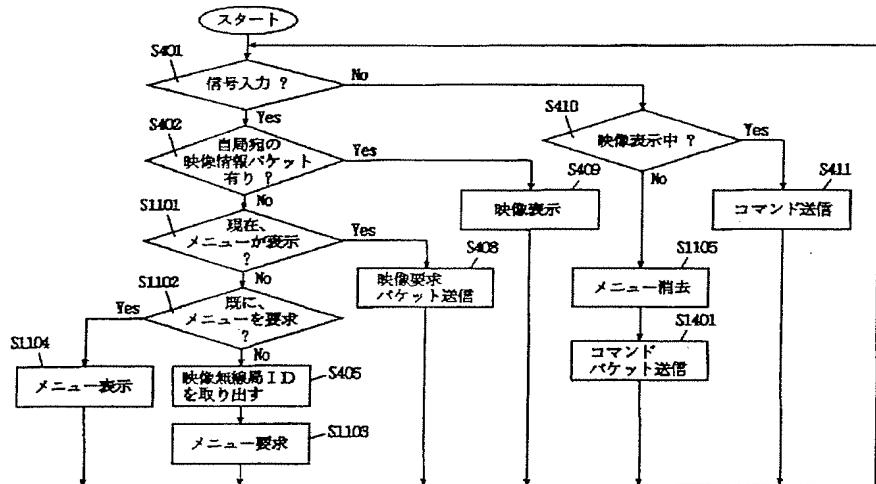
【図23】



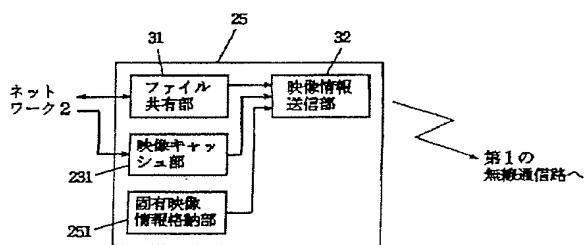
【図12】



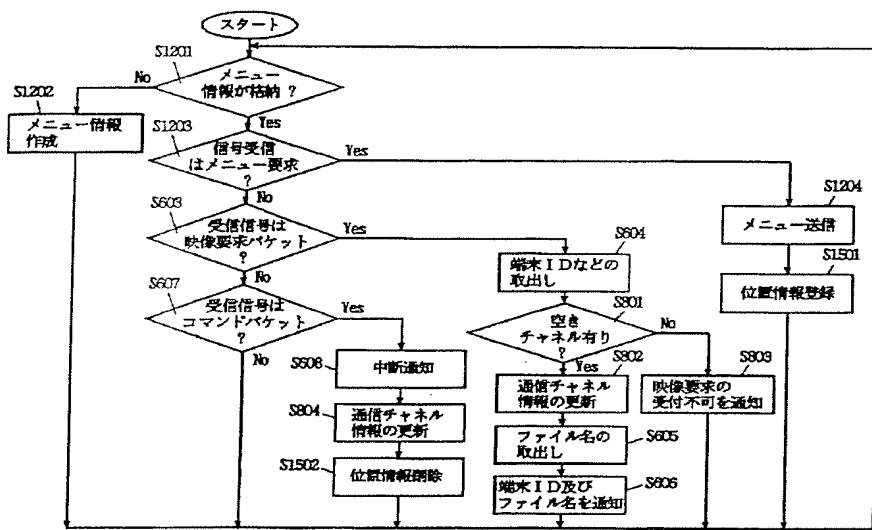
【図14】



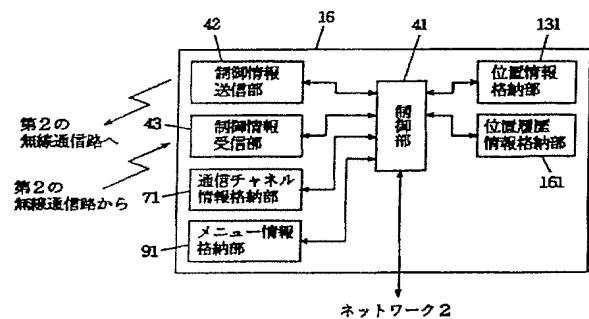
【図25】



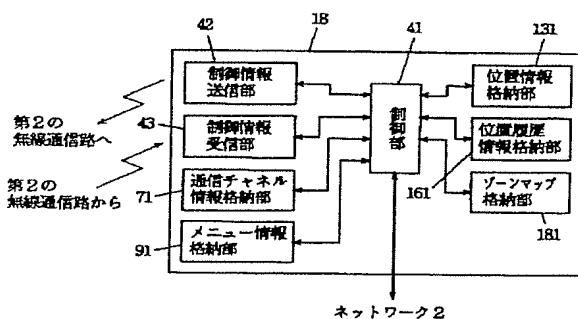
【図15】



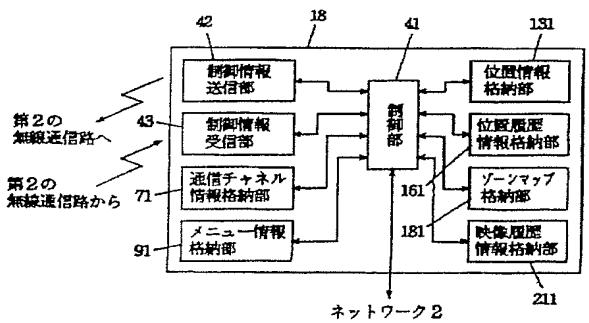
【図16】



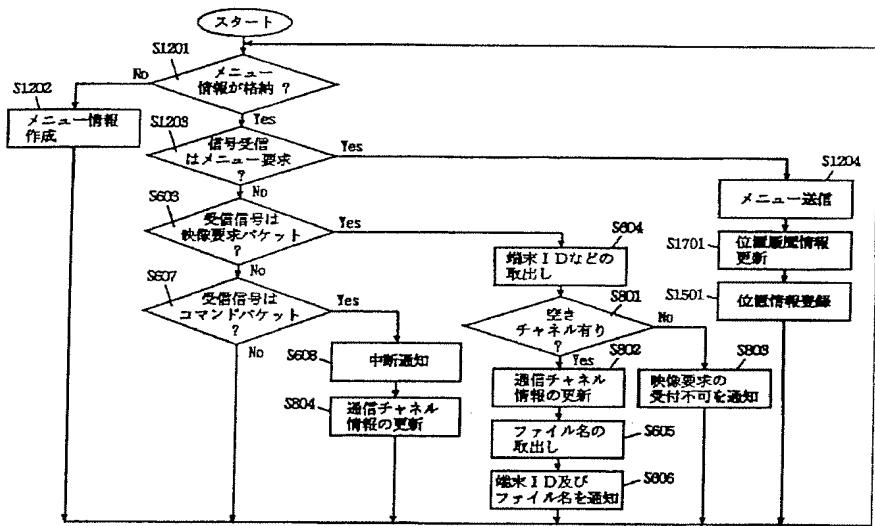
【図18】



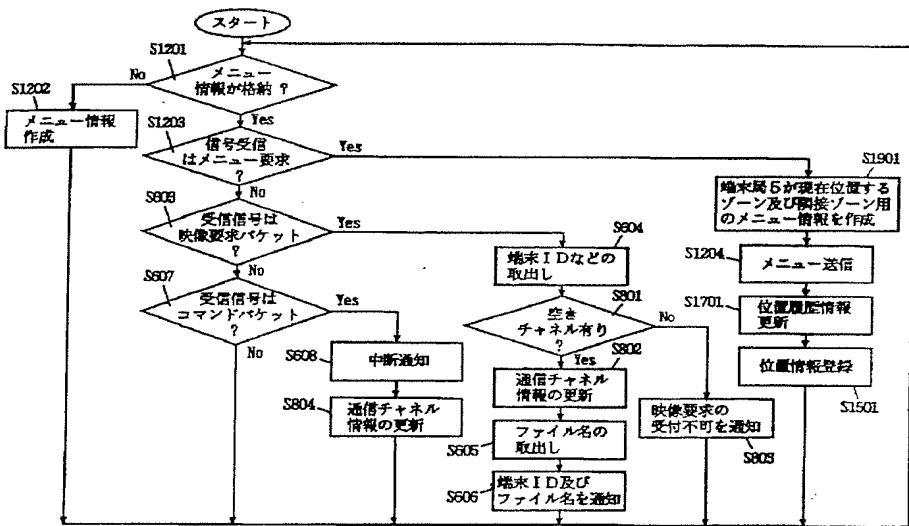
【図21】



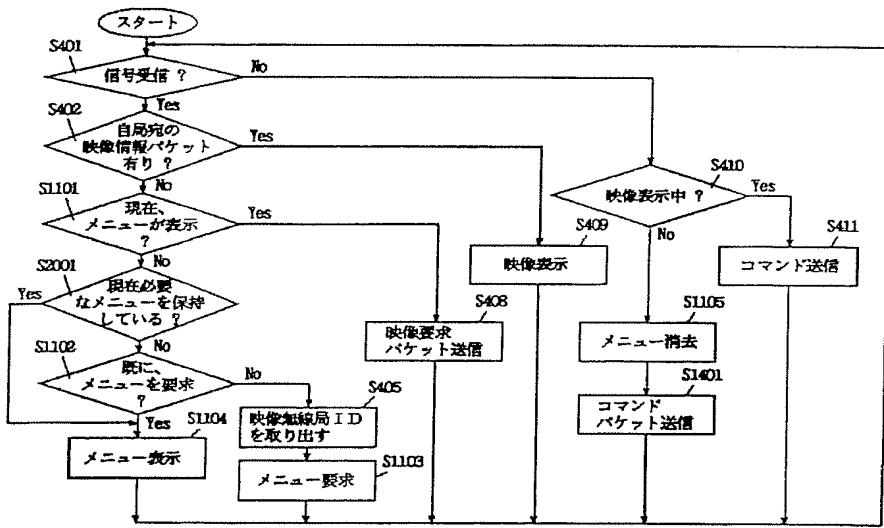
【図17】



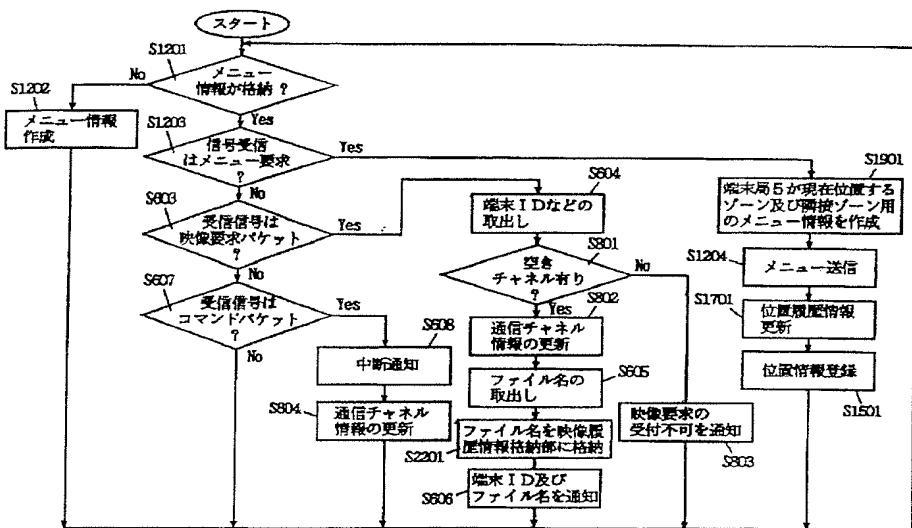
【図19】



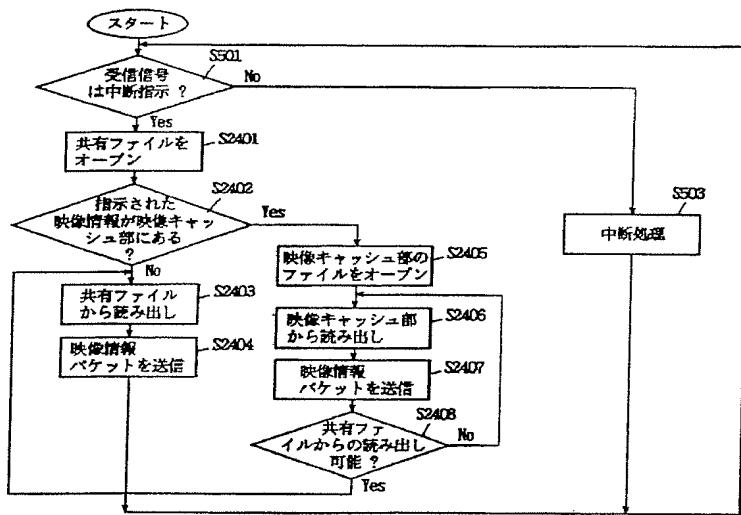
【図20】



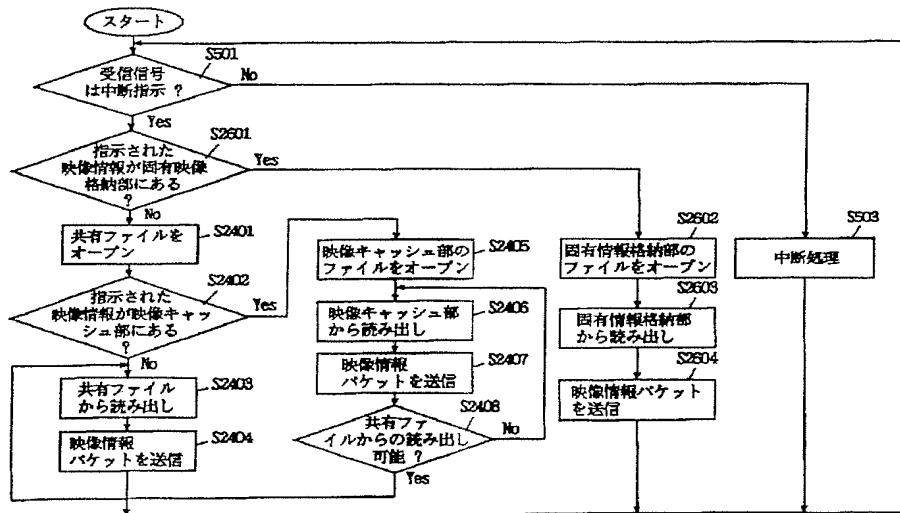
【図22】



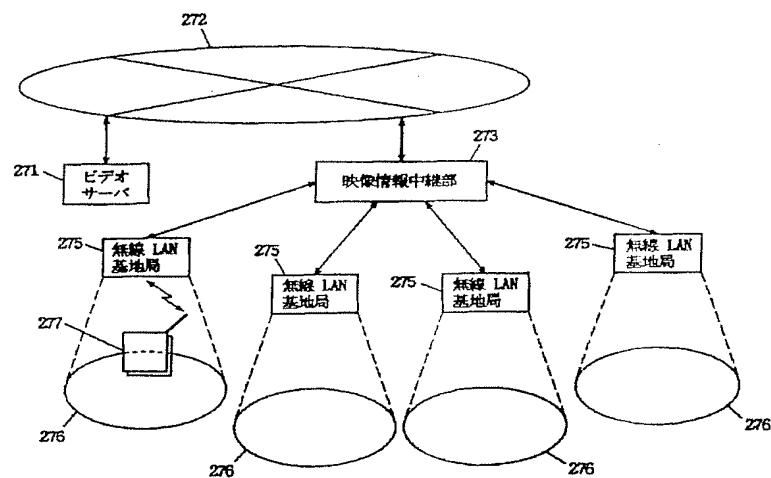
【図24】



【図26】



【図27】



フロントページの続き

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